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NEWSPAPER

U.S.—IBM Reopens With Roar

By Edith Holmes
Of the CW Staff

NEW YORK – U.S. vs. IBM would have resumed with a whimper last week but for the roar of the judge.

Ruling that attorneys for the government and the corporation are simply to note objections concerning documents entered into evidence and ordering that both sides are to stem the tide of motions "inundating" his chambers, Judge David N. Edelstein, chief judge of the U.S. District Court for the Southern District of New York, clamped down on what he fears may be major delaying tactics in this antitrust suit.

Observers noted when the first seven weeks of trial came to a close last July that objections automatically seemed to follow any document entered into evidence.

Two days after the trial reconvened last week following a two-month recess, the judge referred to "a bag full" of motions delivered to his chambers that morning.

That particular bag merely added to the paperwork already covering his desk. "It's impossible for one man to cope with this – even on a 24-hour basis, absent trial time," Edelstein said.

"What do you hope to accomplish by this? . . . Are you perhaps undercutting your intention to serve the best interests of your client?" he asked.

"In addition to your duty to your client, you have a duty to this court," he said.

Insisting that he was "not playing a

(Continued on Page 2)

IBM Study on Peripherals May Affect Telex vs. IBM

By Vie Farmer
Of the CW Staff

LOS ANGELES A hefty 103-plus page document uncovered here last week in the discovery phase of an antitrust case brought by a number of West Coast independents against IBM could spark new life into the Telex vs. IBM case.

The document details recommendations to IBM's Management Committee not to enter the plug-compatible market for other vendors' CPUs because both the competitive and economic rewards would not have justified the expenditure of 12- to 15 man-years of time and an average cost of $750,000 per channel interface.

IBM's successful bid to overturn the verdict in the Telex case that it was a monopoly [CW, Feb. 5] hinged heavily on two points – the definition of the plug-compatible peripherals market, which included all other mainframe vendor's products, and the ease with which plug-compatible interfaces could be built.

The document is a 1971 study entitled "Corporate Marketing Analysis of Should IBM be in the PCM [Plug-Compatible Manufacture] or OEM [Original Equipment Manufacture] Business" prepared for the IBM management committee at the direction of Warren C. Hume, senior vice-president of IBM and member of the Management Committee.

In arguments before the 10th Circuit Court of Appeals, IBM said peripherals are readily interchangeable with CPUs of different manufacturers and contended the only difference among peripherals plug-compatible with the CPUs of different manufacturers is the interface.

"The cost of the interface is an insubstantial portion of the development cost of a peripheral product," IBM said.

The IBM study, on the other hand, concluded that each of these interfaces would require an estimated one-year aver-

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HEW Privacy Act Tactic Sparks Concern

By Nancy Freneh
Of the CW Staff

WASHINGTON, D.C. – The Privacy Act of 1974 went into effect last Saturday amid congressional concern over a tactic adopted by the Department of Health, Education and Welfare (HEW) to avoid keeping records on information its own agencies share with one another [CW, Sept. 24].

By defining its 11 separate agencies as one agency for purposes of the Privacy Act, HEW has legally sidestepped the need to keep a set of records that show when one HEW agency accesses the personal data of individuals kept by another HEW agency, critics explained.

If those records of sharing don't exist, individuals who have been granted the right to access them by the Privacy Act have no way of exercising that right, one critic said.

By studying the agency's routine uses, the individual might be able to guess what agencies "might have" accessed his personal records, but would have no way of knowing when and why, he explained.

HEW's official spokesman on the matter denied any wrongdoing in this decision, saying, "On the surface, it may look as though this is the case. In fact, what we have done is to provide tighter controls by centralizing and maintaining that control at the secretary's level.

"We do not intend to allow free exchange of information within the department. Access to information within agencies and between agencies is still on a 'need-to-know' basis," he explained.

"The only thing we avoid is the onerous internal recordkeeping. I don't think we are endangering the privacy of the recipients of our programs," he added.

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TCA Attendees Advised

Efforts to Add Uptime Not Worth Cost

By Ronald A. Frank
Of the CW Staff

SAN DIEGO – Instead of determining how much system downtime he can tolerate, a data communications user should figure out how much system uptime he really needs.

This was the advice given to attendees of an advanced data communications panel session at the Tele-Communications Association's (TCA) annual conference here last week.

"Limited network downtime need not be a disaster," according to Robert Ritchie, an engineer with the Communications Department of Los Angeles County.

Often the cost of increasing network availability is not worth the small amount of added service it gives to the users, he said.

The cost of increasing a data communications network uptime from 99.1% to 99.6%, for example, could double the cost of the system because of redundant equipment and other backup features, he said.

In the final analysis, the need for uptime is related directly to the application being served by the network, Ritchie said. In an administrative message system, 4- to 6 hour/mo of system outage may realistically be tolerated – even though, from a political standpoint, this should be limited to 1 hour/mo.

It all depends who in management is using the system, he added.

On the other hand, an on-line order entry system needs the most possible redundancy built in.

Instead of just dying out, such a data communications network must be able to "gracefully degrade" into a reduced throughput mode, he said.

Minis More Available

In general, simple minicomputer-based networks have a higher availability figure than complex systems with larger mainframes, according to Lewis Hill, staff specialist for computer communications systems at McDonnell Douglas Automation Co.

The IBM Time-Sharing Option (TSO) is an example of a more complex system in which the programs are developed in a time-sharing environment and run in a batch mode, Hill said.

(Continued on Page 4)

Oregon Privacy Law Too Tough, Meets Death After Three Days

By Ann Dooley
Of the CW Staff

SALEM, Ore. – A three-day-old privacy law was killed in a special session of the Oregon Legislature recently because of the tight clamp it placed on all police and court records.

The law, intended to restrict criminal history records unless a justifiable need for access was proven, instead made it impossible for anyone to get any information whatsoever.

If the law had stood, one family member would not be able to discover if another member had been acquitted in a trial. And police could not tell a wife her husband had been arrested.

The law also banned reporters from seeing police arrest and court records. Civil officials would have incurred a $500 fine if they allowed records to be examined or even discussed a criminal case.

Passed last spring in response to concern for inappropriate use of computerized criminal record systems, the law was modeled after the Privacy Act of 1974. Federal exclusions of original records of arrest, trial and disposition were, however, overlooked in the Oregon bill.

When the deletions were discovered, the state Senate passed a new bill with the exclusions. But in the last days of the session, when legislators were hurrying to leave, the House of Representatives did not realize the importance of the new bill and allowed it to die.

The Senate, meanwhile, assumed the new bill had been passed by the House. It was not until a routine review recently that the significance of the House's oversight became apparent.

The state attorney general's office declared the law unconstitutional, but stated that it would have to be enforced until it was changed or overturned by the

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To Our Readers

Computerworld has learned a man calling himself "Michael Stahls" has called several large installations and represented himself as a member of the CW staff.

"Stahls" has been telling the installations he is preparing a special supplement on software and has asked for the names and positions of the installations' DP employees so that he can send them a copy of the supplement.

No "Miehael Stahls" is or has ever been an employee of *Computerworld*. Anyone receiving a call from this person is urged to ask him for his name and telephone number and then contact Walter Boyd, president of Computerworld, Inc., at (617) 965-5800 or write Boyd at 797 Washington St., Newton, Mass. 02160.

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U.S.-IBM Trial Reconvenes With Roar

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game," Thomas D. Barr, lead counsel for IBM, said he knew the paperwork was a great burden on the judge, but felt "the motions are important to my client."

While Edelstein accepted Barr's good intentions so far as his client went, his ruling and order will stand, and observers hope the pace of the trial may pick up as a result.

Sedate Prosecution

Otherwise, the government pursued its case sedately enough, continuing to call industry witnesses to the stand.

Testifying primarily on the market definition aspects of the suit, James H. Binger, chairman of the Executive Committee of Honeywell, Inc., and Clarence W. Spangle, president of Honeywell Information Systems (HIS) and executive vice-president of Honeywell, Inc., took their turns in the witness box.

Much of Binger's testimony revolved around the capital requirements generally held to be dictated by the lease nature of the computer industry. The Honeywell official illustrated this point by mentioning his company's joint venture with Control Data Corp., launched last spring to develop and market magnetic rotating storage devices.

Under cross-examination by IBM counsel, Binger stated neither Honeywell nor CDC would have sought this kind of arrangement had they not faced restraints to their investment in these storage devices and a need to protect, as far as possible, any capital expended.

He characterized the agreement as "an unusual event," prompted not so much by a desire to achieve certain economies of scale as by the need to finance the project.

Binger used Honeywell's limited marketing of its System 58 in the U.S. an an example of how restricted capital can affect a marketing, let alone a development, effort.

He implied financing was a primary motivation behind Honeywell's merger with General Electric's computer operation in 1970.

Both companies recognized the increasing need for large development expendigures, the large capital requirement demanded by a rental-based market and the rapidly changing application areas desired by users. Both felt a larger company need to be formed if either was to survive, Binger said.

Of the control and information systems sides of Honeywell's house, Binger said HIS "requires more capital." HIS has assets of $1.8 billion while the Control Systems Division can get by with $800 million to $1 billion, he noted.

But despite the added investment, HIS generates the same amount of revenue as its counterpart: $1.002 billion. "Capital turnover is slower and so capital requirements are larger for HIS because of the lease nature of the business," Binger said.

In the U.S., 45% of Honeywell's revenue comes from sales and 55% from rental and maintenance of equipment, Binger stated.

"If leasing and renting were not the norm, Honeywell capital requirements would probably be a third of what they are," he said, adding the company would then be freer to take risks developing additional producta and markets.

Binger testified Honeywell has not had trouble acquiring financing, but that the price of such funds has often been beyond a range considered "practical" by the corporation.

Peripherals Makers No Competition

On direct examination, the executive commented he did not see the independent peripheral companies as competitors of Honeywell because they did not approach the marketplace from a systems point of view.

While leasing companies, are a factor in the market because they may provide financial arrangements on Honeywell equipment not available from the mainframer, they are not direct competitors, he added.

In their cross-examination of Binger, however, IBM attorneys used Honeywell and other third-party documents to show the corporation did consider companies like Cambridge Memories, Inc., Mohawk Data Sciences and General Computer Systems competitors in the peripherals area.

While he did not deny competition with these firms, Binger indicated it was limited to specific instances and particular aspects of a much broader marketplace.

He estimated IBM holds between 65% and 75% of the market and Honeywell, 8% to 10% since its merger with General Electric.

Banks Save 75% in Development Of Cooperative Audit Program

KANSAS CITY, Kan. – A group of banks here got together recently to resolve a mutual problem involving auditing requirements – and each saved 75% on its program development.

The problem was how to get programs written to audit the banks' computer files as required, at a minimum cost and without using the banks' programmers.

The group contacted a local software company and negotiated the production of audit programs, specified by the bank group, on a shared-cost basis.

The banks, Security National Bank of Kansas City, Kansas City Bank & Trust Co., Goppert Banks and Douglas County State Bank of Lawrence, all have NCR computers ranging from Century 50s to Century 200s.

Centaur Systems was able to provide one program which could service all the machines. There were some minor problems with the variety of disk units but nothing major, since Century software and files are almost universal, W.R. Hill of Centaur said. The most amazing part of the project is that the banks could get together to do it, Hill said. "Banks aren't usually that cooperative."

Oregon Kills Tough Privacy Law

(Continued from Page 1)

court. Oregon newspaper publishers were considering bringing suit.

Gov. Robert W. Straub decided the quickest way to deal with the situation would be to call a special session of the legislature. Three days after the law became effective, it was killed.

Bill Expected Again

Known as the "rap sheet" bill, it or a revised version is expected to come up again at the legislature's next session. Legislators will be much more careful in finding out exactly what such a bill entails before passing it, according to Stevie Remington, executive director of the American Civil Liberties Union of Oregon.

Remington said that such a law is necessary because employers look at an arrest record the same way they look at a conviction record.

Jim Durham, a lawyer at the attorney general's office, said that office's position is that all records should be open to everyone for whatever reason.

"Privacy is a kick people are on now," he said.

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Next, we asked three computer installations in the East, Midwest and West to provide the "tracks." They were to choose the files to be run and make the evaluation of the results. No hanky-panky. At one center, all four sorts were put through their paces under exactly the same conditions. At the other two places, SyncSort was matched against the IBM sorts.

Finally, we did something that's never been done before on the playing fields of sorting. We brought in a hardware monitor to judge the events.

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Tries to Add Uptime Often Not Worth Cost

(Continued from Page 1)

When many systems share the operation of a host CPU, any system can cause the host to crash for all systems, he noted.

Closely related to uptime is response time to the terminal. The system could degrade to the point at which poor response may be equivalent to a partial hardware or software failure.

Typical response times vary from 3 sec on minicomputer-based networks to 7 sec on large host interactive nets, Hill said.

Quick Pinpointing

When network outages do occur, the faster a communications manager can pinpoint the problem, the shorter the outage will be, according to Dexter Wallis, supervisor of data communications at Fluor Corp.

In many cases the communications manager will have to spend some money on acquiring test equipment, but the amount of this equipment is directly proportional to his knowledge of what is happening in the network.

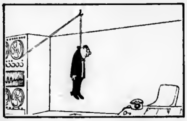
One of the simplest pieces of test gear is a level meter and fixed-frequency signal source which costs about $200, but this can pinpoint about 60% of the analog problems that occur in a network, Wallis said.

In the more costly category, test equipment is now available that will display the bit patterns within the control characters of a transmitted block of data.

This type of unit costs about $8,000, but it allows the communications manager to monitor (for the first time) the characteristics of the teleprocessing software in his network, Wallis said. Even the programmers rarely know whether the software structure is transmitted correctly.

"The communications man has to tie all of the operational requirements, hardware and software together. It is up to him to detect the cause for software protocol errors and delayed responses.

"It is also up to him to detect if the errors are caused by computer software, hardware, lines or terminals," Hill told the attendees.



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HEW Agency Consolidation Tactic Sparks Concern on Capital Hill

(Continued from Page 1)

Centralizing the privacy law's implementation under the HEW secretary's authority means exemptions for any information system within HEW must be approved by the top man.

If appeal by a member of the public is turned down by an individual agency, for example, the secretary can reconsider that appeal, he said.

Members of the House Government Operations Subcommittee on Government Information and Individual Rights have decided to wait and see how things "shake down."

If necessary, oversight hearings could be called or an amendment written, but no subcommittee member would say that is necessary now.

A spokeswoman for the American Civil Liberties Union (ACLU) agreed.

"This is an example of a problem that can come up when a law is open to very broad interpretation," Trudy Hayden, editor of ACLU's *Privacy Report*, said.

"We're not saying this is necessarily an abuse of the law, but it should be noted on a list of potential problems. Undoubtedly, within a few years, there will be a long list of things that will have to be amended," she said.

Some federal officials predicted conflicts would arise between the Freedom of Information and Privacy Acts as early as last January, and this summer the Justice Department was called upon to help clarify the problems, a spokesman from the Office of Management and Budget said.

In a memo by its general counsel, the Justice Department said the word "agency" can mean not only different things to different agencies, but also different things for different purposes within the Privacy Act.

It might be 11 different agencies for appeals procedures, but only one agency for purposes of interagency transfer of personal data, the spokesman noted.

However, the Justice Department memo also said agencies "should not define the term 'agency' with the intent to undermine the purposes of the Privacy Act."

To date, Washington observers who are perusing the various agencies' and departments' guidelines published in the *Federal Register* indicate HEW is the only one to employ this strategy.

Ford Urges Privacy From 'Big Brother'

PALO ALTO, Calif. – Government agencies are legally gathering vast amounts of computerized information on American citizens that is both "excessive and intrusive," President Gerald Ford said at a dedication recently at Stanford University Law School here.

Ford, who declared "we must protect every individual from . . . a 'Big Brother' bureaucracy," admitted "one of the worst offenders is the Federal Government itself."

Ford noted he was not talking about wiretapping or other "improper or illegal invasions of people's privacy or constitutional rights by federal agencies or individual officials."

The threats he had in mind were those that resulted from laws "enacted by Congress for laudable purposes."

These laws encourage government agencies to collect data about such things as the health and behavior of citizens for such programs as welfare, Social Security payments or other special assistance programs.

The government has found legitimate reasons for gathering information on students seeking scholarships, professors looking for grants and business seeking loans, for example.

"The list is endless," Ford said.

Advances in computer technology have permitted the collection and consolidation of greater and greater amounts of data that is retrievable "by anyone trained to push the right buttons," he said.

The Privacy Act of 1974, which went into effect Saturday, Sept. 27, will help, Ford claimed.

"I see the great challenge of our next hundred years as the advancement of individual independence . . . of specific steps to safeguard the identity of each and every American from the pressures of conformity," he said.

Commission Eyeing Reservations

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – What hotels and airlines actually do with their reservations information will be one of the first topics to come under scrutiny by the Privacy Protection Study Commission, the seven-member group decided here recently.

Three other studies will be conducted simultaneously, and findings will be published by Dec. 31. Those inquiries will focus on:

- Use of the Social Security number as a universal identifier.
- Information-sharing practices between states and between states and the Federal government.
- The individual's right to get his name removed from mailing lists.

Although the commission is being courted by representatives of various think tanks, the first four projects will be researched and the reports written by the commission's own staff, a spokesman said.

Data will be gathered through hearings and from the oral and written commentary of experts.

All topics slated for inquiry were mandated by the Privacy Act of 1974, the spokesman said, and at least one, the airline and hotel reservations data study, was an easy subject to start on as a learning exercise.

"It is a boundable problem rather than one that threads all through society and, in studying it, one need deal with only a limited number of organizations," Willis Ware explained. Ware is vice-chairman of the commission, which was established by the act.

"It may well turn out reservations systems are as clean as they come, but I would like to see them documented and in the public eye," Ware said.

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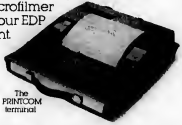

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Beyond PRINTCOM, Kodak is putting a great deal of effort into COM research. Some of this effort and investment has already paid off in technological improvements and versatile software programs Kodak can provide to its users.

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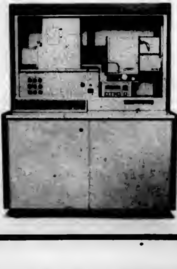

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For a low $2495, Digital's VT55 Graphics Terminal reaches new heights.

Digital announces the VT55 Graphics Terminal. For use with anyone's computer. To handle a variety of applications more productively through the addition of graphics capability. With optional hard copy output. At a unit price as low as $2495.

Use the VT55 for plotting histograms, waveform and peak analyses, data acquisition, monitoring, trending, simulation, laboratory charts and forms, or wherever your applications can be improved through graphics.

Automatic, upward line scrolling enables continuous data entry. Graphic cursors facilitate data editing and graph generation, with x-y plotting (2 values of y for each x) of two 512-point graphs.

Hard copy for either text or graphics display can be generated by an electrolytic copier that can be integrated in the terminal.

A full keyboard offers the complete ASCII character set displayable in as many as 24, 80-character lines.

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IBM Told to Shun PCM

(Continued from Page 1)

age development time at prices ranging from $250,000 to $2 million.

The IBM document then went on to say there was no discernable market for peripherals sold for non-IBM systems.

Meanwhile, the Supreme Court reconvenes this week and is expected to make its decision shortly on whether to hear Telex's appeal of the reversal of the district court verdict.

Then Telex also has a number of other alternatives. The firm can try to establish a violation of the rules of discovery by IBM because it did not release the document before the trial.

Telex can then seek either a new hearing at the court of appeals level or even a new trial, either at the district or appeals court level.

Reactions of Competitors

In the report IBM considered just how its mainframe competition would react. The study estimated that in 1977 competing manufacturers would have 21,258 systems in the field into which it could plug its compatible peripherals.

It estimated about 225,000 devices would be involved and that it could take about 25% of that market.

Reasons against IBM's entering the business, detailed in the document, included:

- It would encourage the business of system integrators and facilities management firms.
- It would force more standardization – IBM products would tend to become less exclusive.
- It would open wider gates to PCM on IBM systems, including the competitive plug-compatible CPUs.
- It would open wider competition for peripherals.
- It would increase the requirement for short product life cycles.
- It would encourage industry standards with a possible impact on design flexibility and innovation.

Reaction Predicted

IBM also predicted its mainframe competition would react in two basic ways: "Larger more established companies, especially those that would manufacture their own peripherals, would compete vigorously.

"They would cut prices on peripherals, change interfaces, bundle hardware, avoid releasing interface data, lock software (may charge IBM a fee), increase maintenance prices on the CPU, exclude all foreign equipment of rental systems and accelerate the introduction of a line of 370-compatible CPUs for attachment to IBM peripheral subsystems in their accounts and IBM accounts.

"The smaller, less-established and new companies would cooperate with IBM and accept the IBM peripheral subsystem as *the* subsystem for their own machines . . . and these companies would then concentrate their resources on the development of a CPU with very advanced architecture.

Interface Development

In reference to the development of interfaces, the study went on to say "[IBM] must have interface data for competitive systems (design and timing information). This data is not 'reasonably' available as there are no OEM manuals . . . past experience on [requests for price quotations] has shown that 'engineer-to-engineer' meetings are required to disclose [interface] information."

The study added there "was no standard interface within competitive systems – everything is unique.

"Interface changes in hardware and software by the competitor," the report continued, "provides a moving target as a design specification."

Telex Asks Judge to Lift Stay

OKLAHOMA CITY, Okla. – Telex Corp., armed with the recently acquired IBM documents, has asked Judge A. Sherman Christensen to remove the stay on the Telex vs. IBM case concerning competition outside the U.S.

The documents were among those "that should have been given to Telex prior to its trial" in its appeal against IBM on domestic competition, Floyd Walker, Telex attorney, said.

Work on the foreign issues case has been frozen since April 1973 by a stay awaiting final decision on the domestic appeal, Walker said.

Telex is asking for the stay to be removed to allow additional discovery to determine why the documents were not given to it previously, he said.

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Hot dog.
A Honeywell minicomputer helps a meat packer.

A well-known meat packer has built a real time warehouse data acquisition and control system around a Honeywell minicomputer, giving him:

- up-to-the-minute inventory status
- logging and verification of shipments received
- a record of actual shipments compared with orders
- automatic collection and transmission to central computer

What can a Honeywell minicomputer do for your operation?
Let's talk.

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Honeywell minicomputers are helping the banking business.

A large bank uses Honeywell minicomputers at three locations to:

- transmit MICR-encoded documents to a central processing location
- receive accounting reports at remote locations from the central computer

What can a Honeywell minicomputer do for your operation?
Let's talk.

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We want to buy your IBM System 370; you want to cut costs.

Let's talk.

At DPF, we'd like to make you an offer that should prove profitable for both of us.

If you rent a system 370, we can purchase it and lease it back to you at considerable savings on a short-term operating lease. Just send us your installed configuration with purchase quotations.

If you already own your IBM system, perhaps you'd like to sell it to us at market price.

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Whatever your situation, we'd like to talk. Contact Mike Swords at DPF Inc., 141 Central Park Avenue South, Hartsdale, N.Y. 10530 (914-428-5000). Or call any of our regional offices listed below.

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Users Seen in Transition To Data Base Orientation

By Patrick Ward
By the CW Staff

NEW YORK – DP users are in transition from a batch-oriented DP technology that provides periodic status reports to a decentralized, data base-oriented technology in which the telephone is the most important terminal, a Univac senior staff consultant said here recently.

Dr. George A. Champine traced the development of the computer from its start as a replacement for clerical labor to a management tool that can answer "what-if" questions.

Manufacturing firms, for example, typically began by using computers to handle accounts payable and receivable, billing, sales analysis, financial reports, stock status reporting and other tasks, Champine said at a conference here recently.

As users grew in sophistication, they applied their DP resources to job cost and scrap analysis, bill of materials, inventory control, budget preparation, maintenance scheduling and other "what-if" applications.

As the industrial users became advanced, they tended to go into numerical control, material handling, tool utilization, scheduling, routing and other more sophisticated applications, Champine said.

At the next level of DP use, industrial firms went more heavily into such usages as design and engineering, industry and market forecasting, pricing, simulation and so on, he said.

This sort of DP use helped management function as a control system by gathering data, summarizing it in reports and identifying the variances from what had been planned, he said.

The kind of technology described here was based on batch processing and periodic, hardcopy status reports. It used special-purpose terminals and preprogrammed, special-purpose software in Cobol or Fortran.

The hardware was localized; there were separate files for each application, and experts interfaced end users to the system.

The management consequences of this approach were that it prevented management by exception and produced too much paper, Champine said.

'Transition Technology'

The "transition technology" users are now resorting to offers terminal input/output and batch-processed updates, Champine said.

Also present are generalized data management systems, remote batch, leased communications lines and redundant centralized systems, he added.

With the move to heavy, online use, reliability becomes crucial. Redundant, fail-soft technology will become more and more of a trend with fourth-generation technology, he said.

Among the economic factors in this transition stage are falling hardware costs. Champine predicted "everyone" will offer 400M byte/spindle disk drives 18 months from now, and 1,000M byte/spindle disk drives will follow. Mass storage costs will be down by a factor of three or four by the end of the decade, he added.

At about that time, "future technology" will offer some systems in which no programming is necessary, he said.

Among the management consequences will be management by exception and reports on demand.

Simulation Preference Models Help Developers Plan Effective Land Use

MADISON, Wis. – How can the land-use planner help real estate developers make the most effective use of undeveloped areas?

Answers to this question are being approached through computer simulation preference models by James Moore, professor of landscape architecture here at the University of Wisconsin.

The models help explore the process of decision making and predict the outcome of the trade-offs made by people in deciding where to live or where to place a business.

"We just don't have a good way to anticipate reaction to innovations in land use," whether they are for new housing, businesses or public structures, the land development specialist said.

Moore's research on the effective use of undeveloped land involves extensive inquiry into this decision-making process.

He begins with an individual model – couples thinking of buying a house, for example – and learns what trade-offs they make in their final choice.

The individual consumer decision is the least complex but, even so, "we have to simulate a housing market and deal with husbands' and wives' arguments, which is a pretty wild thing to do," he remarked.

The simulation model allows the rating and ranking of hypothetical homesites from a 30-criteria preference sheet filled out by the couples.

Predictions made from the model by the university's Univac 1108 system were more than 80% accurate in a 50-couple sample, Moore said.

System Picking Crowd To Welcome Hirohito

HONOLULU – Mayor Frank Fasi is turning to a computer to make sure some "plain folks" will be on hand to greet Japan's Emperor Hirohito and his wife when they visit Hawaii this month.

A crowd of 2,000 will be selected by computer from the list of the city's registered voters to assure the emperor and empress will "see and be seen by a cross section of our population," Fasi said.

Charge it.

Honeywell minicomputers help make credit checks.

A company uses Honeywell minicomputers to provide credit card and check authorization services for clients like department stores, discount houses, supermarket chains and nightclubs. The minicomputer system:

- maintains a file on over three million client accounts
- receives inquiries from 3,500 touch-tone telephones in 285 locations throughout the U.S.
- replies via voice-answer-back within three seconds
- records all inquiries for client auditing and billing of services

What can a Honeywell minicomputer do for your operation? Let's talk.

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Bugs.

Honeywell minicomputers help keep defects out of new cars.

A major automobile manufacturer uses Honeywell minicomputers for a real time vehicle assembly quality reporting system. Defects found at inspection points are fed directly into the computer resulting in:

- up-to-date defect reports via CRTs at assembly points
- early spotting of trends
- reduced factory rework cost and fewer warranty repairs
- emergency backup for large dual host processors that schedule operations and parts deliveries

What can a Honeywell minicomputer do for your operation? Let's talk.

NAME ____________________
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Honeywell Information Systems, 200 Smith Street (MS 440), Waltham, Massachusetts 02154

Editorial

A Sad Commentary

It now appears Congress left a loophole big enough to drive a truck through when it drafted the Privacy Act of 1974.

And the Department of Health, Education and Welfare (HEW) has found that loophole and is behind the wheel, ramming its way through this opening in the law.

The problem lies in the seemingly innocuous definition of the term "agency." The Privacy Act gave the term the broadest statutory meaning.

According to the Office of Management and Budget's guidelines, an agency is "any executive department, military department, government corporation, government-controlled corporation or other establishment in the executive branch, including the Executive Office of the President or any independent regulatory agency."

In its implementation guidelines, HEW – with 11 agencies, 130,000 employees and control of one-third of the federal budget – has chosen to define itself as *one agency* [CW, Sept. 24]. This move effectively exempts the entire department from the Privacy Act's requirements to:

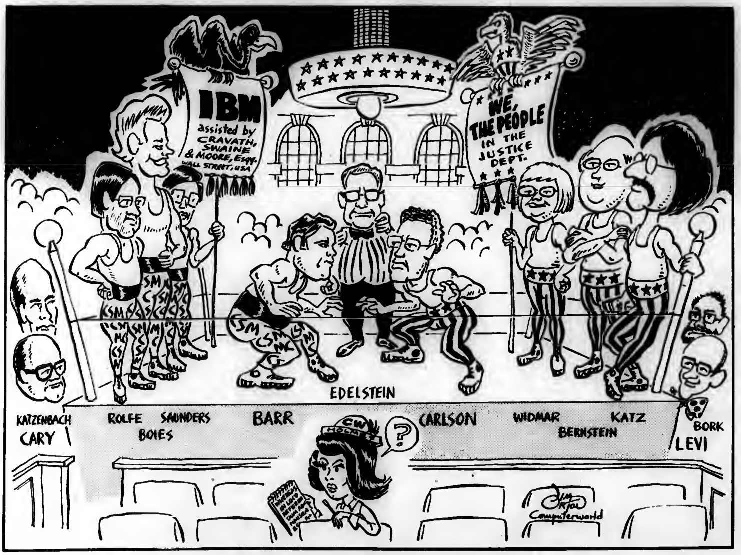
- Keep records of disclosures between agencies. Exchanges between the Social Security Administration and the Office of Education, for example, would not have to be recorded because the two are part of the same "agency."
- Make available those disclosure records to the individuals named in them and allowed by the law to examine them. If no records are kept of disclosures within HEW, however, individuals will not be aware their records were shared.
- Inform agencies about any corrections or disputed information in records they may have received. Again, if no records of disclosures within HEW exist, to whom could these corrections be sent?

Ironically, it is HEW – under whose auspices the original recommendations on the management of automated personal data systems were made – that is making a virtual mockery of the law.

As matters stand, HEW will allow agencies having such vastly different statutory authority as the Office of Education, the Public Health Service, the Social and Rehabilitation Service and the Social Security Administration to continue to share information for purposes other than that for which it was collected – at its own discretion.

But this case may be only the tip of the iceberg. As congressional oversight committees begin to plow through the foot-thick implementation documents published by the various other "agencies," more problems are bound to surface.

(Letters to the Editor on Pages 11 and 12.)



The Battle of This Century (And Possibly the Next?)

Letters to the Editor

Use Macro Identifier On Indexed Labels

In the past, some readers have complained about the indexed labels generated by certain macro instructions. This may be due to the lack of information contained in those indexed labels which have a standard, unvarying prefix.

The information content in an indexed label can be greatly improved by using a prefix that identifies the macro instruction. This will allow anyone to identify the macro instructions used and their locations from a cross-reference listing. If the first character is carefully chosen, these indexed labels will be collected apart from the others used.

R.A. Sobieraj
Perth Amboy, N.J.

Wall Street Qualified To Name Survivors

In the article predicting survivors in the mainframe arena, the New York Stock Exchange firm of Shearson Hayden Stone, Inc. (SHS) predicted that only IBM and Burroughs Corp. would survive [CW, Aug. 13].

Wall Street should be as well qualified as anyone to select firms to drop out because profits are too low – Wall Street is littered with the bodies of member firms that have folded.

SHS is an example of a shotgun marriage of two such brokerage firms. How can such losers tell us anything?

Bryan Dietz
Minneapolis, Minn.

Congratulations, CW

I want to congratulate *Computerworld* on the recent article, "View from Below Shows Manager Should Leave His Quirks Home," by Robert Powers [CW, Sept. 10].

I was particularly pleased with the chart of composite management categories and suggest this be used as the basis for a rating form on management performance.

Esther Rosenstock
Lefrak City, N.Y.

Aid to Cost-Conscious

Regarding the issue of stamping prices on individual items, why not develop a register which prepares a tape containing quantity, alpha description, net weight, total cost and unit cost information?

Such an item would minimize supermarket labor and would provide a valuable service for the cost-conscious shopper.

Willis H. Sargent
New York, N.Y.

Sunnyvale

A year or so ago, when my house lease expired out in the Boston suburbs, I talked to my boss Pat McGovern, publisher of *Computerworld* about a new location. One possibility was Manhattan, warts and all; the attraction was primarily the headquarters operation of the Association for Computing Machinery (ACM), of which I had just been elected an officer. Another was Europe, where Pat was finalizing plans for *Computerwoche*.

In the end, we decided I should stay near home base for one more year, and I came into an apartment in Back Bay. That lease too is up, and the movers came yesterday!

ACM is doing just fine, and our German sister paper has been born (and frequently carries Black Hat/White Hat, in the original, ah, English). So I'm going to relocate to the West Coast and spread the *Computerworld* net a little wider. My wife Nancy is already at work at a computer service operation in Santa Clara, so we found a town house nearby in Sunnyvale, and I'll work from there.

I'll remain an editor of *Computerworld*, but "editorial director," pleasantly though the words ring, would be an exaggeration. I hope to find an academic connection to replace the small one I had at Boston University. And I'll consult for International Data Corp., CW and for outside organizations also.

I hope readers will continue to send letters and other material, although time-sensitive press releases had best be directed to the editorial offices in Newton. My new address will be 1383 Zurich Terrace, Sunnyvale, Calif. 94087. I'm particularly anxious to act as a focus for both northern and southern California computer happenings as we are often unable to cover press conferences or announcements out there because of the expensive distance from Boston to the Pacific. For major events, a *real* reporter or editor is of course dispatched, but I can blow the occasional whistle. And provide detailed coverage of the better parties – *viva* DCA!

New England is enormously stimulating. and I have valued the opportunity to work on the privacy scene in Massachusetts. But California has always been Computerland to me; I hope my visa is still in order!

Herb Grosch

Suspicious DP Outputs Demand Auditor's Attention

The Taylor Report
By
Alan Taylor, CDP

Recently a senior IBM executive launched a strong attack on internal auditors with regard to their alleged "perfect" record of failing to find cases of computer-related fraud in 1973 and 1974, when plenty of such cases were occurring.

The attack came from IBM's manager of security, Robert Courtney, who said the internal auditors had played no part in any of the 600-odd cases that had occurred during the period, even though the average amount of money (in the 1974 period) involved was $554,000.

Certainly, with frauds of this magnitude coming up practically daily, some attention has to be paid to the matter. Unfortunately, Courtney did not consider the question of whether the internal auditors had any way of finding out about the frauds, preferring to hold them up to ridicule before the Data Processing Management Association (DPMA) national convention this summer.

In fact, if he had considered this question. he might have pointed out to his audience the importance of analyzing what have been referred to as "hot spots" in this column over the past few months. Hot spots, in this context, are areas of poor systems design which cause problems with public relations, customers, etc., while not stopping the system in any way.

Zero-Balance Dunning

Some of the hot spots that were discussed involved inflexible credit card numbers, unchecked digits on overdrawn credit accounts, too-flexible airline reservation systems with unnotified cancellations, etc.

Another example of such a hot spot to be discussed this week is the case of the dunning demand for a balance of zero, an instance of arrogance that has been occurring now for well over 13 years and which continues to occur with monotonous regularity. This problem is one which the DPMA audience probably had never considered in relation to the question of security.

St. Joseph Mercy Hospital in Ann Arbor, Mich., which issued the zero-balance dunning message to a reader, Suresh Bazaj, is a substantial financial operation. It has 550 beds, and anyone who knows anything about hospital costs will realize an average computer fraud is certainly not to be ruled out with this amount of money hanging around.

However, any connection between such a fraud potential and the billing arrogance of zero-balancing dunning seems – on the surface – to be ridiculous. After all, the system did not ask Bazaj to pay any unjustified amounts, so where is the fraud connection?

Below the Surface

However, an internal auditor is expected to look below the surface. Here the situation is very different. After all, what the statement said offers no real evidence of what the hospital records said about Bazaj.

Even what is reported on the hospital terminals need not reflect the full, computer-stored records – a fact every internal auditor should remember.

An embezzler, moreover, has more things to be concerned about than getting the false checks printed or whatever his method is of obtaining the cash. He also has the task of keeping the books balanced to evade routine detection. And balancing the books implies being able to falsify them as needed.

With such serious computer frauds occurring daily – even though they may not often be reported to the proper authorities – internal and external auditors, DPers and managers should certainly investigate any circumstances that suggests records could be falsified, even though no actual falsification is currently being done.

The nature of falsification potential resulting from the St. Joseph zero-balancing dunning can be seen by simply reversing the standard computer explanation, that is, that it is a program mistake in the selection of the message.

Instead, look at what the consequences would be if one assumes the dunning message is correct – and the zero balance on the statement is where the mistake actually is.

The dunning message indicates:

- There is a positive "payable by patient" amount recorded as being due from Bazaj, even though he owes the hospital nothing.
- There has been at least one month since he received service (which is correct, since the statement date was July 31, and service was received June 14).

If the real amount due is not what is on the statement, then the hospital's accounts receivable figures are being inflated, even while Bazaj is not being asked to pay any more.

To determine which of the two possibilities is really correct requires investigation, of course. However, the internal auditor could find some clues on the statement itself. For instance, there is the statement, "If there is a balance shown in the "payable by patient" column below, a payment card has been enclosed."

Such a statement gives the auditor a way to check whether he is dealing with a dunning message flag or a suppressed balance. A dunning message error would not initiate the enclosing of a payment card, while a suppressed-balance situation might very well trigger a payment card. Bazaj received a payment card with this zero-balancing bill, in an apparent confirmation that something was in the patient balance field that was not being printed.

In fact, there is yet a third suspicious circumstance hinted at on the statement. The St. Joseph Mercy Hospital system apparently invites an embezzler to use some differences between the statement given to a patient and the hospital record as an almost undetectable way of fraud.

The form itself reads: "We are enclosing an extra copy of this statement for your convenience. We will be unable to provide any additional copies." And, sure enough, Orville Somers, the hospital's director of information systems, had to ask me for details about what was on the statement after he had investigated the matter for me.

Enough Information

All in all, there is quite enough information available in such hot spots to start internal auditors questioning and to give them justification for doing so. Yet I doubt whether many, if any, internal auditors or external auditors would ever investigate a wrongly placed 60-day dunning message.

After all, everyone knows computers make mistakes. Particularly when a tape drive breaks down while an Autocoder and Cobol mixture is being run on a Model 40 during the unification of two systems (which was what happened at the hospital).

So perhaps the IBMer's attack on the auditing profession was at least partly justified.

By the way, nothing in this article should be taken as suggesting any actual embezzlement or record falsification is taking place at St. Joseph Mercy Hospital. The comments on its billing system are simply to show there are methods available which permit internal auditors to initiate appropriate investigations.

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Letters to the Editor

Nothing Embarrassing About IBM's Riches

Other than to express an obvious dislike for IBM, one wonders what the purpose was of George Warren's commentary "IBM Attempting to Diminish Embarrassing Cash Hoard," [CW, Sept. 17].

Warren selected figures from IBM's 1974 annual reports and surrounded them with innuendoes in an effort to convince us there is something tainted about the firm's financial structure. He would have us believe IBM has vaults full of gold doubloons and pieces of eight.

Everyone knows that Fortune 500 company IBM is big, big, big. Of the thousands of banks in the country, over 90% have total assets less than $1 billion. It's intuitive that IBM's "cash hoard" would be larger than most banks.

A ratio of 30% of cash to total assets is not unusually high; it represents planned liquidity and financial stability. A return on investment of 8% for investment securities for 1974 was not high for the period.

Perhaps management did anticipate payment of judgments or possible restructuring, recognize the growth of lessors and other vendors, plan for future acquisitions, or decide to shift from a growth stock to one more dividend-oriented. Whatever the reason, there is nothing embarrassing about liquidity.

Paul R. Lee
Memphis, Tenn.

Vive La Difference — Sex Bias No Disgrace

After all these nice letters in response to my letter of Aug. 20, I think it necessary to explain my point of view a bit further.

Unfortunately, it is a fact that not all men are created equal; thereby killing an all-American dream, of course.

Nobody denies all should be given equal education, equal opportunity, equal rights. But, in spite of all this, certain groups are more endowed than others for a given task.

In DP, men will still wind up in first place more often than women at the rate of 9:1. This meaning survival of the fittest, who is then to blame a staff manager for having a 9:1 bias against women?

Neither Women's Liberation nor progressive legislation can do anything about this.

Mind you, true discrimination is no disgrace and means "to each his own." Females have other qualifications in which they perform much better than men, thank heaven. Vive la difference.

Thomas Mooshammer
Berlin, Germany

Taylor Topic Untimely

My deepest appreciation goes to Alan Taylor for his "timely" topic on the Darmstadt check-digit method in his Sept. 17 column.

I haven't seen that new and innovative method discussed since we used it to assign check digits to savings account numbers in 1960.

I wonder if Taylor could now please tell me where I could get a good 602A calculating punch to generate me some check digits?

David O. Cantrall
Springfield, Ill.

Article Too Emotional

I have two criticisms of the article, "Users Who Ended Contracts Say Honeywell Tried to Take Specs" [CW, Sept. 10]:

- The content of the article was highly emotional.
- The article dealt with vendor maintenance responsibilities, which are subject to individual contractual interpretation, and did not present the vendor's interpretation of a highly technical area, except for a brief explanation at the end of the article.

The interjection of highly emotional subjects in a nationwide technical publication offers no service to the readers.

The individual communications presented were of no material issue to the problem in the article. As a result, the article gave the reader the impression Honeywell was an unworthy vendor when perhaps the customer was at fault.

If the purpose of the article was to question the vendor responsibilities with regard to maintenance support of hardware, then the article should have discussed current practices that exist with all vendors.

If the maintenance responsibilities of a vendor have been canceled, it seems a customer would no longer require the vendor to maintain current logic charts and wiring diagrams. Such documents would be worthless unless current.

This article, in my opinion, has done a great disservice to Honeywell. Perhaps the article accurately depicted the approach that company had with this vendor. If so, Honeywell should be criticized, but not in the form *Computerworld* has chosen.

The article has not improved my technical or professional knowledge as a DP manager, nor has it really stated the factors in the case in a manner which can be evaluated.

Gerald L. Bortle
Oklahoma City, Okla.

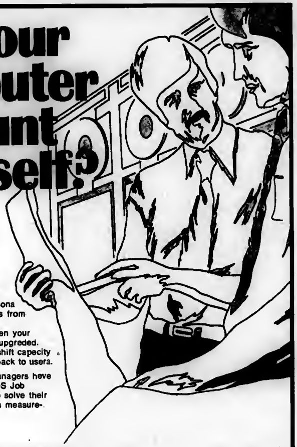
470V/6 Costs Less

Amdahl Corp. thanks *Computerworld* for its report of the Amdahl 470V/6 currently under test at the University of Michigan, which appeared on the front page of the Sept. 10 issue. I found the article factual and positive.

I would like to take exception to one point in the article. It is highly unlikely an IBM 370/168 Model 1 would be less expensive than an Amdahl 470V/6, and we know of no Model 3 168 configuration which is less expensive than our 470.

Direct comparisons are difficult, since 16 channels, a 16K high-speed buffer and high-speed multiply feature are all standard on the 470; even so, a 370/168 user could reasonably expect to pay less for the 470V/6 than for his currently installed 168.

Kenneth W. Simonds
Director of Market Operations
Amdahl Corp.
Sunnyvale, Calif.



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IMS Works for University After DBMS 'Rules' Bent

By Don Leavitt
Of the CW Staff

ANN ARBOR, Mich. – Sometimes the "rules" that seem to be growing up around data base management systems (DBMS) have to be broken – or at least bent – to have a successful installation.

That appears to be one of the lessons learned during an IBM IMS implementation effort at the University of Michigan, according to Greg Shaw, the administrative data center's manager of systems programming.

The university acquired IMS about three years ago with a good idea of why a DBMS might be useful, but without any substantial effort to evaluate the range of DBMS that were even then on the market.

"We were interested in the university providing some integrated information for management and the facilities to allow the users to get at this base of information directly," Shaw explained.

But he didn't run any comparison tests or anything like that before choosing IMS as the vehicle the university would use. He looked at some of the other choices, but decided the university had been getting good support from IBM and might as well stick with that vendor.

One of the things most important to Shaw was to have a system that would support terminals as well as the data base itself and that, in his view, limited the options open to him and led directly to the IMS selection.

In-House Training

Once the DBMS was installed on the center's 370/155 – upgraded just this summer to a 158 – Shaw tried to do a little in-house training and organized his crew to find out what information should be in the data base. The training consisted of "getting a couple of people who knew IMS" to run some classes.

Other than that, "we organized a task force of about four senior systems analysts to work with the user departments in identifying the information we needed to support their offices. We wanted to design that first data base around the offices and the functions they were performing."

No decision had been made at that stage as to which specific application should be the first installed in a DBMS environment, but the center staff had "pretty much decided" it would go with student-related development first. The press of both regular and ad hoc reports seemed to focus on student enrollments and the like.

"By inputting this information, we thought we'd get the best payoff at the earliest time," Shaw said, outlining two of the best bases for any management decision.

The data center was careful of the way it started: "We didn't want to get too fancy the first six months or so. So we designed and implemented a data base for student accounting – essentially a billing function – that had a simple physical organization without a lot of logical connections or anything of that sort."

Early on, Shaw started using a data dictionary to help his programmers know what they were doing in building the data base. The center chose University Computing Corp.'s UCC Ten package which, despite the vendor's name, is not especially tailored to university needs. "We like it. It's good," the manager volunteered.

Use of a dictionary followed the classic DBMS "rules," but the university's approach to data base administration was something else again. "We have a couple of fellows designated as coordinators and they take the brunt of the problems," Shaw explained.

These coordinators – picked from among the center's senior programmers – "track things down, making sure the parts of the system are running in 'sync' " but the administration function is clearly dispersed among the senior programmers and the data center director's staff.

There is no single authority to decide on changes in the data base. The staff members are divided along application lines and within their own areas; application programmers are encouraged to develop their own fields, their own data base designs.

Coordination of these separate designs takes place in weekly meetings between programmers and analysts. The meetings are scheduled for 10:00 every Friday and are chaired by one of the "coordinators."

The leader helps to keep things moving, Shaw said, "but responsibility for data base design still stands within the applica-

(Continued on Page 14)

CDC Service to Back Technology Swaps

By Edith Holmes
Of the CW Staff

MINNEAPOLIS – Users of Control Data Corp.'s Cybernet time-sharing network who have technological problems may soon be able to identify people and companies with solutions to their difficulties.

Beginning around the first of the year, CDC expects to have a service capability, Technotec, and an organization, Worldtech, to promote the transfer of concepts and techniques around the world.

These organizations will offer an interactive technology marketing service through Cybernet, according to Gerard M. Beaugonin, a CDC spokesman.

Technotec subscribers willing to market their ideas, processes, patents, know-how or expertise will write descriptions of these into the data base; other subscribers willing to do business will search the data base for solutions to their particular technological needs.

The success of the communication achieved will depend on the users themselves and not on the Technotec organization, Beaugonin stressed.

"Subscribers will pay on the order of $100 to store a message in the data bank for a year and users may retrieve it at any time for a few dollars," he added.

Those retrieving information will be charged according to the time they are on-line, based on an $80/hour rate. If they uncover a contact through the system that seems by its description to be worthwhile, a fee of $50 will be charged for the name and location of the company or individual, he explained.

Transaction Files

The service will be structured into three major transaction files, each containing specific types of information, Beaugonin said.

The Techno-Stock file will hold offers of existing technology that an individual or organization is willing to market.

The Techno-Quest file will contain descriptions of unsolved problems and opportunities for joint ventures for locating or developing technology.

The Techno-Aide file will consist of names of experts in such areas as finance, consulting, training and marketing who may be required to assist in the transfer of technology.

Beaugonin noted each unit of information in these three files will contain three segments organized to provide the most efficient method of locating a particular offer or request:

- The Descriptor – a narrative test drafted by the subscriber to the service which explains the capabilities he is offering or seeking.
- The Selector – a set of key words identified by the subscriber as being representative of the technology defined in the Descriptor.
- The Contact Information – the name, address and telephone number of the individual to contact for further inquiries and/or business arrangements.

"Technotec users search the data base by entering keywords related to the information they seek. When 'hits' or 'matches' are displayed by the system, the user may request the retrieval and printing of the pertinent Descriptors," Beaugonin explained.

Control Data Technotec, Inc. can be reached through P.O. Box 0 HQW11A, 55440.

'QCRT' Aids On-Line Programs

WALTHAM, Mass. – Setting up CRT displays for inquiries, data entry and file updates may be simpler than ever for IBM 360/370 users with the load-and-go Quick Change Real-Time (QCRT) on-line processor, according to the vendor, The Management Group, Inc. (TMG).

QCRT supports both the formatting of the displays and the logic for editing, validation and any other processing required to create the screen display or to work with the operators' responses to the display.

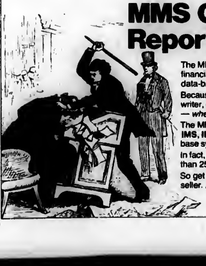
A dummy display can be put up on a screen to check format and content even before users attempt to work with the program being generated, TMG noted.

Working with a set of three highly structured coding sheets, the QCRT programmer has a parameter-driven system similar in some respects to a report generator. Unlike the older approaches, however, QCRT is fast, the vendor said. It is designed to cope with the special problems of response time, a spokesman added.

The package can work with multiple files, multiple record types, hierarchical file structures and data bases. Although a generalized data base interface isn't available, working with a particular application under Cincom Systems' Total or IBM's IMS, for example, is "straightforward," TMG said.

QCRT is written in Cobol and Assembly for IBM 360/370 equipment and requires about 50K of memory. It currently runs under IBM's Customer Information Control System (CICS), but TMG said it would adapt the on-line processor to most other communication systems without additional charge.

The package is available now for $10,000 provided use of the system is limited to one application. For unlimited use, the cost goes up to $25,000, a spokesman said from 393 Totten Pond Road, 02154.



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Ingalls Uses System 2000 for Shipbuilding Control

PASCAGOULA, Miss. – The Ingalls Shipbuilding Division of Litton Industries is building two fleets of ships for the U.S. Navy, including 30 of a new class of advanced destroyers and five general-purpose, amphibious assault ships called LHAs. Both ships are big and sophisticated.

Ingalls has total responsibility not only for the design, engineering and production of these ships, but also for the procurement, integration, testing and installation of their extensive electronic equipment; training of the Navy crews; and outfitting of the ships with all spare parts, consumables and other materials necessary to support the ships during deployment.

To assist in the reporting requirements for this large manufacturing process, Inglass Information Systems Department uses the System 2000 data base management system (DBMS) from MRI Systems Corp.

Labor Control System

Reporting of labor and material data is very critical to the total process; therefore, the Information Systems Department is first implementing a labor control system and a purchase order control system.

The labor control system provides planning and scheduling of manufacturing work packages, budgeting of those packages, validation of labor charges to them and reporting of labor-related data to management.

The data base for this system processes batch input from the Production Planning and Scheduling Control Department for scheduling data, from the Industrial Engineering Department for budgeting data and from the production crafts areas for labor charges.

These organizations are supported by technical inquiries to the data base to determine work package status. Hardcopy reporting is periodically provided to reflect manufacturing progress and any deviation from the master plan.

The purchase order control system provides comprehensive coverage of material and services procurement, receiver and invoice processing, cost assignment, inventory pricing and response to planning and scheduling.

The purchase order data base contains information which may be viewed from any management level and presented in any perspective desired by the viewer.

The current data base, installed on one of the shipyard's two 2M-byte 370/158s, includes 160M bytes of information on two double-density 3330 disk packs.

The shipyard plans to continue development of new applications, and the base will shortly be increased to a billion bytes of data on five double-density 3330 spindles, according to T. Guy Smith, supervisor of systems programming.

Smith categorized the capabilities of System 2000 as good but not excellent because, although the vendor is adding multithread facilities [CW, Sept. 3], the system till now has been limited to handling just one transaction at a time.

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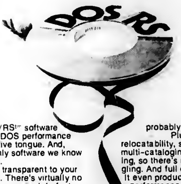

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Implementation Effort for IMS Eased by Bending DBMS 'Rules'

(Continued from Page 13)

tions area."

The student accounting application they used as a DBMS pilot project was a good one, in Shaw's eyes, since it started from a system that had been originally written in 1969 and, even then, was expected to be an on-line system. The initial IMS effort was to replace a file update section of the old system with a data base update module.

As with so many projects, however, things didn't stay that simple. As long as they were working on the system logic, they added a whole new subsystem – for withholding of credit under specific circumstances – and did some work on student loans, too.

And that's why the effort took six to nine months, rather than the four a simple transition effort might have taken.

Since then, other elements of the hopefully all-encompassing student-related data base have been added. Latest of these additions was the installation about four months ago of an on-line registration system.

Use of this system peaks at the beginning of new semesters, reaching workloads as high as 2,500 transaction/hour coming in from 30 Texas Instrument Silent 700 and 735 teletypewriter terminals in the main registration arena. But with the university's desire to work with the students, making changes when they seem needed, some 1,200 transaction/hour are handled by this system on "regular" nonregistration days.

The application logic of the registration system checks incoming requests to be sure the student meets the requirements for the requested course.

It also has some message-switching links to other systems to ensure, for example, that a student cannot enroll for new classes if he has a serious, outstanding tuition bill.

Registration not only triggers student schedules and orderly use of the university's faculty and facilities, but the online system also ties positively to the student accounting system so tuition bills for the newest class loads are generated directly.

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'Bug Catcher' and 'Compressor' Improve Test Runs, Data Files

HUNTSVILLE, Ala. – Programmers apparently can debug source code more quickly and then run their programs utilizing highly compressed data files with two packages now available from General Computer Services, Inc. (GCS).

The $1,000 Bug Catcher is an Abend recovery routine designed to capture and correct data exceptions occurring during program execution.

In addition, the subroutine will notify the program in which it is residing of the occurrence of the data exception, GCS said.

The Compressor is described as a high-performance compression/decompression Callable subroutine, designed – like the Bug Catcher – for IBM 360/370 operations. Its particular value, the vendor said, lies in its ability to compress and decompress packed data fields.

Since business-oriented files typically include a large number of blanks or repetitive digits, use of any compression logic can cut sharply into the tape or disk space required. Reductions with the Compressor average 70%, the vendor claimed.

The package appears easy to use. No input data definitions are required; the routine applies what it determines to be the appropriate compression algorithm and handles all data conversions in one pass.

The Compresssor requires 1,900 bytes and is available for $5,000.

The Bug Catcher is similar to other data-exception handlers in permitting test sessions to continue even though multiple errors are identified. It differs from some others in providing an abbreviated dump format and a means of bypassing erroneous records in a production environment.

The formatted dump shows location of the problem instruction, operation code, operands, relative address of the instruction within the program, base and displacement of the operands and corrective action taken by the Bug Catcher itself.

GCS can be reached through P.O. Box 5148, 35805.

'Datacom/DC Entry' Aids Novice User

DALLAS – Datacom/DC Entry from Computer Information Management Co. (CIM) is a single-task communications control package designed for IBM 360/370 users installing initial on-line terminals.

It requires no specialized precompilers to produce on-line program modules. With the exception of the single entry limitation, it offers the basic capabilities of the firm's Datacom/DC multitasking monitor at lower cost, a spokesman said.

The Entry version is upgradable to CIM's full Datacom/DC multitasking data communications monitor as well as the Datacom/DB full data base management system as the user's volume and terminal network requirements grow, the company noted.

Local, Remote Support

Datacom/DC Entry provides both local and remote terminal support with the standard masking facilities. Only those capabilities required in high-volume advanced networks are not included in the Entry version, according to CIM.

This version of the communications controller requires 30K to 34K bytes of memory. It includes some BAL coding and is therefore limited to IBM 360/370 sites. It operates under either DOS or DOS/VS but not under OS.

Datacom/DC Entry costs $15,000 with 10 days of on-site education. Also included is a special conversion-cost saving if and when the user upgrades to the Datacom/DC communications monitor.

CIM is at 3707 Rawlins St., 75219.

RJE Concepts, Benefits Topic of Free Seminars

TOWSON, Md. – Martin Marietta Data Systems will hold free, half-day seminars on computing power through a remote job entry (RJE) terminal in Cleveland, Chicago and Philadelphia this month.

The presentations are designed to show ways of acquiring, replacing or enhancing in-house computing facilities, a spokesman said.

The seminar is scheduled in Cleveland on Oct. 15, Chicago on Oct. 22 and Philadelphia on Oct. 23. Information on times and locations is available from the firm at 300 E. Joppa Road, 21204.

A Better 'Grasp' on VS

BURLINGAME, Calif. – DOS/VS users can get additional statistics on the operation of their systems with enhancements to Grasp/VS from Software Design, Inc. (SDI)

Grasp and the newer Grasp/VS are themselves enhancements to IBM-provided DOS and DOS/VS software.

The new functions allow the user to monitor the paging activity of each program executed and of the overall system. Paging statistics are provided in "page/hour" which are measured for each job, by partition and for the system as a whole.

Review of "pages in" and "pages out" counts, again by job and for the system, can also help the user determine a "virtual program efficiency coefficient," SDI noted, adding that, as a general rule, minimizing "page outs" will improve overall performance.

Other modifications to Grasp/VS accounting procedures provide the user with data on real storage used by each program. This includes all pages used dynamically taken from the page pool by the program and is reported by average and by maximum bytes used.

The average real-storage-used figure is described by SDI as "the first true measure of working set size known to be commercially available."

The maximum real-storage-used figure is a measure of the overall storage utilization at execution time and "should help the user to minimize storage contention in a VS environment," the vendor claimed.

Grasp/VS will also report the number of I/O operations with the amount of I/O time used by the Sysvis device.

Grasp/VS, including the updated logic, is available for $238/mo from SDI at 880 Mitten Road, 94010.

"My team evaluated every Database Management system going. We picked IDMS and the choice was easy. Here's why."

William Casey

"I know exactly how you feel about choosing the right Database Management system because I've done it. You think it'll be a tough decision. We thought so too... but it wasn't.

My team (from a large insurance company) surveyed the entire field, then boiled it down to five Database Management systems and two File Management systems.

We started out completely impartial. But from the first one system kept standing out: IDMS. It offered many features that simply weren't available on other, much larger, systems, yet it had an overhead figure of only 50 K.

Its variety of data placement techniques, its unrestricted facilities for logically relating all data under its control, its provision for an unlimited number of database entry points, and its superior space management approach amounted to both a substantial performance edge and a flexible database architecture advantage.

With data independence established by means of separate schema and subschema compilers, we realized that many applications programs would no longer depend on data definitions they themselves employed.

From a programming point of view, the system was miles ahead of its competition. Example: IDMS's DML processor inserts all necessary data record descriptions directly into the user's COBOL program and allows use of database-oriented verbs, such as FIND, OBTAIN, or STORE.

We were pleased to find that IDMS is the only system currently running on IBM (OS and DOS) and Univac Spectra equipment that corresponds to the CODASYL DBTG specification of April 1971. Machine independence is always an important consideration, and IDMS represented the perfect answer to that issue.

Also, the IDMS/CULPRIT retrieval system, running from the same data definitions that the user established to create his database network, provides unlimited database access facilities for reporting purposes.

We found the documentation was beautifully done – complete and well-presented. The users we contacted were most enthusiastic about the system and confirmed what we'd heard – that the Cullinane Corporation has an outstanding reputation for support.

If you're serious about Database Management you have to look seriously at IDMS.

Write or phone for a technical brochure or call me, William Casey, and if my travel schedule permits, I'll personally show you exactly how we compared the various choices and why we picked IDMS. You see – I liked IDMS so much I joined the Cullinane Team.

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A Modest Proposal

SR^2 Takes Period to Logical Extreme

Concepts and Techniques

By J.T. Arnold
Special to Computerworld

After implementing William B. Simmons' Structured Period Concept (SPC) [CW, Aug. 20] to use Cobol's Rudimentary Blocking Facility in my latest program, I found the technique so beneficial I carried it to its logical and extreme conclusion with a revolutionary concept of my own: the Structured Right Side Rule (SR^2).

, Stated briefly, in its simplest and most elegant form, the SR^2 rule is: "No character may appear in any column except 12." This has allowed us to write Cobol with a right-hand side as precise and as non-ragged as the left.

A minor drawback was initially encountered in that we could not get our compiler to generate anything except diagnostics.

This was overcome, however, by writing a Cobol preprocessor that converts dedicated characters of the alphabet to Cobol division names and verbs. This was an acceptable compromise. It allowed us to visually inspect our SR^2 source code with ease.

After dedicating characters of the alphabet to our preprocessor, we discovered we had only five characters left for paragraph names and data names. This is actually beneficial, since program size is kept to just a few lines and the programmer is forced into a modular system design.

Hallowed Laws

When we first began implementing our revolutionary concept. we were somewhat dismayed to think we were losing the import of the hallowed laws of the original Codasyl committee when they constructed a language that would "read like English."

We were not deterred from such a sacrilege, however, since our technique is not much further afield than the SPC, where the period for a sentence is alone on the left side of the page and on the next line.

Some difficulty was encountered in getting our printer to distinguish between the small, trivial period and the larger ('upper-case?) end-of-sentence period. Finally, an extra zero filled with liquid solder was added to the print chain, thereby resolving the matter from a hardware point of view.

Isolated instances of social abrasion have occurred, though, since senior programmers want exclusive use of the big period and restrictions on coders to use only the little one.

Arnold identified himself (herself) as senior member of an information systems staff but, probably in self defense, did not identify any employer.

In fairness, it should be noted that the period used in the illustration accompanying Simmons' original proposal was enlarged by Computerworld *for clarity. Simmons himself is a one-size period advocate. Ed.*

Bid/Asked Quotes Shown

STAMFORD, Conn. – Brokers and analysts can have immediate details of the best bid and asked price on securities listed on either two of the New York, Midwest or Pacific Stock Exchanges with the Q-Quote service from GTE Information Systems, Inc. (GTE/IS).

The service is based on dedicated GTE/IS Videomaster CRT terminals in user's offices linked to GTE's computer center in New Jersey, which is linked in turn to the stock exchanges.

The service covers about 1,200 of the 2,000 securities linked on the New York exchange, a spokesman said.

Conventionally, most brokers focus on just one of the exchanges and are not aware of specific trading activity on the others, he said, adding that Q-Quote is designed to highlight the best quote, wherever it is.

GTE/IS is at One Stamford Forum, 06904.

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GBASWIFT is the powerful, efficient teleprocessing monitor for DOS and DOS/VS users.

DATAPRO has rated it above all other monitors in overall satisfaction, vendor support and ease of installation. GBASWIFT has capabilities and features not found in the largest, most complex TP systems available, but its ease of installation and simplicity of use can't be matched by even the smallest mini-monitor.

Teleprocessing is probably the most over-evaluated and least-understood area you have to deal with. Evaluations are typically exhausting, tedious, expensive and, for the most part, wrong. Potential TP users are blinded by buzzwords and abstract nonsense.

At GBA International we know that the only way to evaluate a monitor properly is to install one. GBASWIFT can be installed and operational in a couple of hours, and your first application can be coded from scratch and running the same day. While other companies are making sales presentations, flashing flipcharts, and touting optional Cadillac features, GBA International is in the machine room getting the job done.

If these claims sound outrageous, listen to what some GBASWIFT users had to say when asked about our claim that GBASWIFT can be "installed in a few hours."

"Unbelievable, but true."
T W Dowling, Data Processing Manager, States Steamship Company.

"This is not a claim, it is a fact!"
Florence Harteloo, System/Procedure Analyst, Clark County Public Utilities District, Vancouver.

VENDOR SUPPORT

"Very knowledgeable and competent. A pleasure to work with people who 'know' the product and didn't finish some training school just 2 weeks before you did yourself."
Roger D Mills, Senior Programmer/Analyst, Public Utilities District No 1 of Snohomish County, Washington.

"They know what you don't on practically any subject—be it TP monitors, Data Base, or operating systems. Remarkable knowledge of Hardware functioning. Neat people to work with."
Dan Fish, Systems Supervisor, County of Sonoma Data Processing Center.

"GBA International's SWIFT took the lead with a 4.0 in the area of Vendor Support. The other monitors followed, the report said, with Minicomm earning a 3.4; Task/Master a 3.2; Environ/1 and Intercomm, 2.8's; and CICS, a 2.7.
Datapro as reported in Computerworld, p.14, Jan. 22.

PROGRAMMING

"Absolutely—You don't need Super People to write Super Programs. If the programmer can issue a simple Assembler 'CALL' from a Cobol program, he can write TP programs in literally hours."
Dan Fish, Systems Supervisor, County of Sonoma Data Processing Center.

"Within an hour's briefing any average programmer can be writing application programs with GBASWIFT handling all the interfacing."
Chad Julian, Director of Data Processing and Systems, Kwikset Div. of Emhart Corporation.

"We were able to bring up 3 application programs in one afternoon—the same day our terminals were turned over to us by the vendor's installation team. We had no opportunity to test beforehand, either."
Stu Fletcher, Programming Manager, Cal-Farm Insurance Company.

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Intertel Modem Allows Use of Unconditioned Lines

Special to Computerworld

BURLINGTON, Mass. – Users of a 9,600 bit/sec modem from Intertel are finding 9,600 bit/sec data transmission is possible over ordinary, unconditioned transmission lines and most Direct-Distance Dial (DDD) lines as well.

"We ordered unconditioned Bell-3002 private lines for several applications, and Intertel's MCS 9600 modems perform well," according to Gunther Kempin, manager of communications planning and engineering at Manufacturer's Hanover Trust in New York City.

"We can also operate satisfactorily at 9,600 bit/sec over dialed connections through the DDD network," he said.

Users can save money by operating on unconditioned lines, Intertel said. They save telephone company installation fees for conditioning, and every month they pocket the charge that would normally be spent for C2, C1 or D1 conditioning.

In addition to the savings, users notice that leasing unconditioned lines often means shorter average repair times for the lines. The phone company may take less time to restore leased-line service for less tightly specified circuits, some users believe.

The capability to back up the 9,600 bit/sec data traffic on dialed connections is important to on-line users because it means a net can continue to operate when private lines go down without any changes to the DP system.

The user pays only line fees for the time he actually uses the dial backup links.

Joe Rosenberg, manager of communications for El Al Airlines, said he can save El Al $200,000/year by using the Intertel modem on dial circuits and eliminating the rental fees for a backup, 4-wire private line from London to Tel Aviv.

"We tested several domestically manufactured 9,600 bit/sec modems and found the MCS 9600 gave better performance than others, especially over DDD circuits," Dave Stout, communications engineer at Quotron Systems in Los Angeles, said.

"It was the only modem capable of giving acceptable performance at 9,600 bit/sec over the DDD circuits tested," he said.

As well as being a 9,600 bit/sec modem that operates on unconditioned lines, the unit is also reportedly the first to operate with a full-fledged 150 bit/sec secondary channel.

The secondary channel puts 150 bit/sec data on the same lines used for 9,600 bit/sec data and eliminates the lower speed lines. Use of the secondary channel option will further increase savings by eliminating the need for separate teletypewriter circuits in El Al's network, Rosenberg said.

Other options available for the Intertel modem include a built-in buffered multiplexer with switched carrier control and an automatic dial backup module that enables CPU-site personnel to establish dial backup circuits without the aid of remote-site personnel.

Intertel is at 6 Vine Brook Park, 01803.

SDLC to Have Impact on Communications Gear

By Robert F. Wickham

Special to Computerworld

Synchronous Data Link Control (SDLC), the communications line discipline associated with the IBM System Network Architecture (SNA) offers a number of significant advantages to users of data networks.

Since SDLC, in some form, is destined to become the industry standard protocol for exchanging information between termination points in networks, the impact on users and suppliers of data communications hardware will be enormous.

With the SNA concept, users and suppliers have a common point of departure in planning and implementing teleprocessing networks of all sizes. In addition, SDLC formatting of the data interchange between points in a network permits the intermixing of common carrier, value-added network or satellite facilities for the communications links.

Defines Interaction

SNA defines the way in which the various elements of a teleprocessing system interact to provide an efficient and reliable interchange of information. As defined by IBM, this network architecture is implemented by a combination of hardware, software and a data link control or line protocol.

By distributing processing and control functions throughout the network, a general-purpose network architecture is created which is capable of handling a wide range of transaction types, terminal hardware and network delays.

At the present time, SNA hardware implementation is by means of a VS/370 host computer with a 370X programmable front-end processor. Terminal systems are application-oriented and include the 3600, 3650 and 3660 transaction-oriented systems, the 3790 general-purpose processing terminal, the 3770 remote job entry system, the 3767 printing terminal and the 3270 CRT terminal.

All terminal devices contain some amount of processing and memory and are designed for a distributed-processing environment.

Software for implementing SNA includes a Virtual Terminal Access Method (Vtam) which connects the terminals with the applications programs and the virtual operating system (OS/VS).

Network and terminal control is delegated to the Network Control Program (NCP) resident in the 370X front-end processor.

The link between the host processor and the processors in the terminals is by means of the SDLC line protocol. The system software also provides for on-line diagnostics and fault reporting for equipment connected to the network.

Provision is also made for handling binary synchronous and stop/start line disciplines and terminals.

The availability of a line protocol such as SDLC, particularly if it is adopted as an industry standard for handling the exchange of information within a network, permits users to implement larger and more complex networks which can accommodate a wide variety of terminal and transaction types.

Although the exact definition of SDLC is quite complex and still in a state of flux, SDLC incorporates such features as full-duplex operation, cyclic redundancy check error-detection techniques, variable information field length and the ability to handle synchronous and asynchronous terminal equipment. SDLC is speed transparent and, therefore, can be used at all levels within the network.

In the past the combination of Binary Synchronous Communications (BSC); an access method such as Qtam, Btam or Hasp; and hardware which emulated IBM terminals gave the independent teleprocessing hardware and manufacturers access to IBM systems. Likewise, the new combination of Vtam, NCP and SDLC provides an opportunity for further expansion of the IBM-compatible terminal and front-end processor. In addition, as other mainframe suppliers adopt SDLC as the standard for their systems, the amount of independently supplied equipment will grow.

The widespread use of SDLC will not occur overnight; rather it will require several years to fully assimilate and respond to the benefits and problems associated with the change to SNA and SDLC.

The complexity of the hardware, software and communications protocol inter-

(Continued on Page 22)

FDS/I Releases Terminal for Thrift Institutions

ORLANDO, Fla. – The FDS/I Division of TRW has introduced an on-line teller terminal designed for statement savings, checking and credit-card transactions at thrift institutions.

The TT-140 is described as the first nonpassbook teller terminal to incorporate in one unit an alphanumeric printer and a tutorial display that works with a back-lighted keyboard.

The unit also features an integrated plastic card reader, plus stand-alone capabilities when operating off-line.

The terminal is a little smaller than an electric typewriter. It is geared to thrift institutions – savings and loans, mutual savings banks and credit unions – complementing passbook savings plans with statement savings, the firm said.

The microprocessor-based statement savings terminal is said to be the first in the thrift industry to include a self-contained alphanumeric printer. This allows validating and receipting with identification of savings deposits, loan payments, drafts or checks, and data can be transmitted in English – instead of teller code, the firm said.

Indicator lamps are used as a tutorial guide to lead the teller through the transaction by asking for account, number, balance and amount. This tutorial capability coupled with the back-lighted keyboard keeps the teller informed of where the transaction is and what should be done next. Also, alter lights inform the teller of an error condition.

Personal Identification Numbers

The plastic card reader can work in conjunction with an optional ten-key security pad on which the customer enters his secret Personal Identification Number (PIN) to provide positive identification. This procedure can familiarize customers with the use of the plastic card and can be the initial step in electronic funds transfer systems (EFTS) and point-of-sale (POS) services, the company said.

The keyboard features 22 function keys and eight status/alert keys which can be defined by the institution.

The terminal is compatible with earlier terminals used in the TRW transaction processing system. The TT-140 shares the same communications lines and can be linked to existing TT-108 teller terminals, a branch terminal controller or directly to a terminal processor.

The price of a typical transaction-processing system, including four TT-140s, four TT-108s and two CRT administrative terminals ranges from $57,000 to $71,000.

Software and installation management are included. Deliveries of the TT-140 will begin in the fourth quarter from 3606 Silver Star Road, 32808.

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(left) *AJ 830*, the *new* 30 cps impact printer terminal which features quality and reliability.

(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.

(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer and TWX/DDD versions).

(below) *AJ 630*, a 30 cps quiet non-impact printer terminal with 140 character print line. (APL is an option).

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And Tape Cassette Recorder

Trendata Adds 4000P Teleprinter Unit

SUNNYVALE, Calif. – Trendata's Model 4000P terminal is designed for high throughput and accuracy and provides up to six copies on a 30 char./sec daisy-wheel printer.

The keyboard configuration follows the IBM Selectric layout and is surrounded by clustered control keys, Trendata said.

The keyboard also includes a 10-key numeric pad with an operator-programmable field delimiter key.

Standard features included with the 4000P are switchable 10- to 12-pitch character spacing, switchable 10- to 30 char./sec send/receive speeds, vertical forms control and Ascii coding.

The base one-year lease price on the Model 4000P is $180/mo including maintenance.

Tape Cassette Recorder

Trendata has also added the Model 4000 tape cassette recorder (TCR), which allows users the capability to prepare data offline for later local use or transmission to other terminals or remote CPUs.

Local editing features include the capability to edit data being recorded in character, word or line increments and the ability to search, at high speed, recorded data (forward or reverse) to any of 4,800 addresses on the tape.

Multiple tape decks can be connected to allow merging of data and other applications requiring multiple deck usage.

Terminal Transactions

Savings in connect time can be achieved in the conversational terminal environment when data is recorded and edited off-line for later transmission to the host CPU at speeds of 10-, 15-, 30- or 120 char./sec, the firm said. Control codes, generated from the Model 4000 line of terminals or a remote CPU, dictate the operation of the 4000 TCR.

The one-year lease rate for the Model 4000 TCR, including maintenance, is $75/mo from the firm at 610 Palomar Ave., 94086.

'Floppy Killer' Has Processor

UTICA, N.Y. – The Cogar Corp., a subsidiary of the Singer Co., has introduced a low-cost intelligent terminal with a 16K-byte processor and hard disk storage.

The Singer Model 1501-40 intelligent terminal is dubbed the "Floppy Killer" because it is said to rival the economy of a floppy disk system while offering the performance and reliability of a hard disk with up to 5M characters of storage capacity.

The 1501-40 is designed for stand-alone data centers or multiple remote sites, where reliable random access to data files (which floppy disks are not designed to provide) is a necessity.

The terminal can interface with IBM, Univac, Singer and other mainframes. Interfaces have been developed that allow the 1501-40 to emulate the IBM 2780, 3780 and 360/20.

The on-site disk is said to reduce the amount of data that has to be transmitted to the central site by remote offices. The fixed disk can be updated by automatic down-line data loading.

The basic 1501-40 includes a keyboard CRT, cassette drive, processor with 16K of storage, serial I/O channel and a 2.5M-byte fixed disk.

This configuration costs $13,600; one- to five-year leases are available. A communications option for either asynchronous (to 1,800 bit/sec) or synchronous (to 9,600 bit/sec transmissions costs $1,222.

First deliveries are scheduled for January from Cogar at Cosby Manor Road, 13502.

Graphics Unit Costs $2,995

BEAVERTON, Ore. – Tektronix, Inc. has introduced the 4006-1, the firm's lowest cost graphics terminal.

The unit sells for $2,995 and leases for $150/mo on a two-year lease.

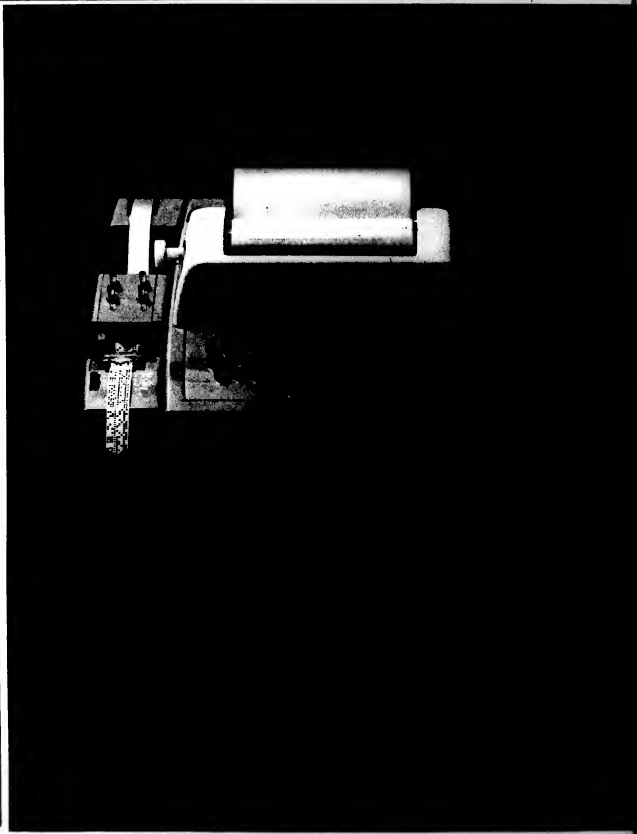
An interactive graphing package written in Fortran allows the user to generate graphics using English, the firm said.

The 4006-1 has selectable data rates from 75- to 4,800 bit/sec. It is compatible with RS-232A, -B and -C interfaces.

There are two modes of operation, Alpha and Graf. In the Alpha mode, the screen can display 2,590 characters, or 35 lines with 74 char./line.

A 5 by 7 dot matrix is used and there are 63 printing characters. In the grahics mode, there are 1K by 1K addressable points, the firm said.

The 4006-1 will be available Oct. 20 from the firm, whose address is Box 500, 97005.



User Skirts RJE Limitations With Management System

ALBANY, N.Y. – Unhappy with the traditional limitations of remote job entry (RJE), the State University of New York (Suny) Research Foundation here has taken a different approach to terminal utilization.

The foundation developed a combined real-time and batch system, known as the Remote Entry Management System (Rems), to manipulate its central computer and to avoid contention with other system users.

Rems has been operating successfully for the past four years, averaging 20 hours a day, six days a week.

To accomplish its tasks, the foundation leases a portion of Suny's central computer, an IBM 370/158. A teleprocessing network of IBM 3270 terminals links most of Suny's campuses, plus other participating institutions throughout the state, to the Albany site.

Each day, remote offices interact with the 370 to extract information from its data base and enter new transactions. The foundation capitalized on this real-time data entry and combined it with multitask batch processing to come up with Rems.

'Aversion to Hardware'

"I think we have an aversion to hardware," James D. Dillon, the foundation's assistant director, said.

"We are by nature service-oriented, that is, tied to results rather than methods. If we thought the foundation could effectively serve its clients with a minicomputer, we would probably do it.

"However, we need the large, disk-based facilities of Suny's 370. We also need autonomous control over our own programs to ensure we fulfill our administrative obligations and meet our tightly scheduled payroll commitments without scheduling interference from other system users.

"For this reason, we developed Rems," he explained.

Rems is neither a hardware device nor a software package but a concept, born of necessity and designed to manage a large computer resource from a remote location, he said.

"Initially Rems began as RJE. However, we were not willing to live with the traditional limitations of RJE. We had to do away with unit record concepts and the master/slave approach normally associated with RJE.

"Rems provides us with 160-character output records and succeeded in reversing the master/slave relationship between central CPU and RJE terminal," Dillon said.

Control Where It Belongs

With a Mohawk Data Sciences 2400 system equipped with card reader, two printers and a CRT as well as a modified Hasp package in the 370, "we have effectively relocated the 370's operator console to our own corporate headquarters. Total control of the foundation's information system is where it belongs – at the foundation," Dillon said.

"From here, our programmers can compile their own jobs; we can monitor the status of the terminal network, and our own console operator can access the system as needed.

"By maintaining all our files on-line, we don't have to rely on the mainframe operator, except to keep the system running," Dillon said.

The principal liability which Rems confronted, according to Dillon, was insufficient control by the remote operator over his own jobs. Under traditional RJE concepts, the remote operator can only enter Hasp commands. Also, application program operator messages are normally routed only to the mainframe console.

Rems provided the following solutions:

- A command was added to the Hasp repertoire which allows the remote operator to cancel his own jobs directly, even during execution, without having to bother the mainframe operator.
- The Hasp console support routines were modified to display and log operator messages from application programs directly at the remote workstation.

The remote operator can also reply directly to these messages. Previously, jobs which relied on an operator for input or control data required the remote operator to call the mainframe operator to enter the correct sequence of replies.

- The Hasp command processor was improved to ensure the proper remote station is replying and to allow either the mainframe or remote operator to logically vary the remote CRT console on- or off-line.
- The Hasp repertoire was also altered to display outstanding replies only for the requester, thus providing a certain amount of privacy for messages directed only to the Rems operator at the foundation.

"The sum total of these changes has provided the foundation with control over remotely submitted jobs comparable to what we would enjoy in a local, dedicated environment. And we receive these benefits without the economic burden of a separate mainframe," Dillon said.

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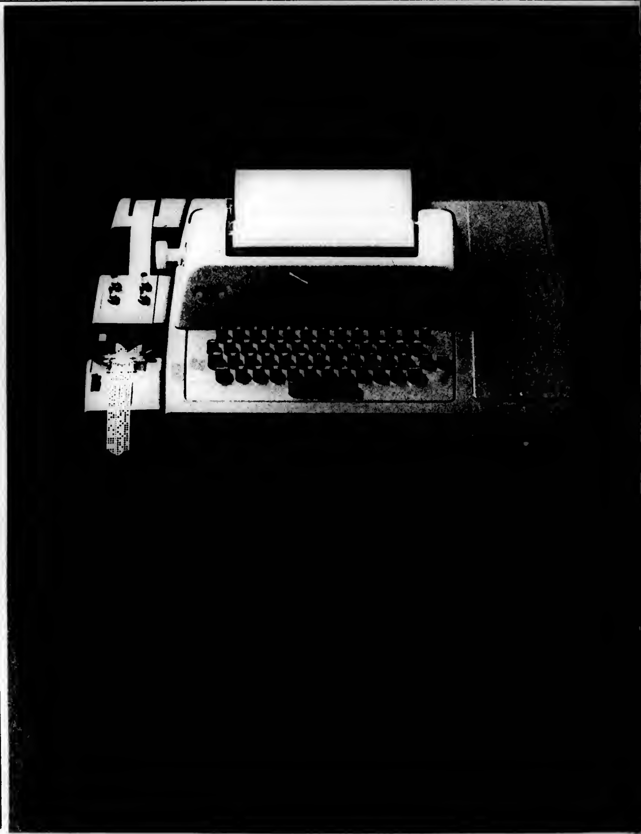

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TELETYPE

SDLC to Have Impact on Communications Hardware

(Continued from Page 18)

actions in SNA will make the connection of non-IBM terminals to IBM systems a formidable job. The availability of low-cost minicomputer and microcomputers will play a significant role in new terminal designs, and terminal software or firmware will be used to ensure terminal compatibility in any particular IBM teleprocessing system.

Another option for independent hardware suppliers is to provide a complete teleprocessing system with the Vtam-NCP interface being the system access point.

Over the next few years, the semiconductor suppliers will introduce families of LSI chips which will provide an economical method of implementing SDLC at the hardware level. This will have the effect of making future SDLC-compatible terminals price competitive with existing asynchronous and bisynchronous terminals.

The hardware most affected by the introduction of SDLC includes front-end processors, concentrators, multiplexers, modems and the entire range of interactive and batch terminals. In most cases, SDLC will have the effect of accelerating the movement of large corporations and government agencies to large, general-purpose networks interconnecting a number of host CPUs and a variety of terminals.

New Technologies

Concurrent with the introduction of SDLC, the U.S. is undergoing a rapid expansion of its data communications channel capacity. The widespread use of satellites is imminent and will significantly reduce the cost of broadband data links.

SDLC is but one of a number of new technologies stimulating the growth of data communications facilities.

The change from hard-wired to programmable front ends will be given added emphasis by SDLC. The shifting of the network and terminal control functions to a separate peripheral processor improves the efficiency and throughput of the teleprocessing system.

The rapidly decreasing costs of minicomputers and the availability of standard communications software packages from both the mainframe suppliers and the small computer vendors will continue to encourage the transition.

Hardware Changing

The hardware for various network control functions such as concentrators and multiplexers is also changing from hard-wired to programmable. The use of processor-based remote concentrators permits the system to change to meet future growth and performance needs.

In the short term, while the industry is changing into the SDLC environment, these programmable processors will be used throughout the network to enable the non-SDLC portions of the network such as terminals or dedicated data links to interface to the general-purpose SDLC network.

The change to SDLC in networks will require full-duplex modems. Although some full-duplex modem products are currently available from Bell and the independents, a new need exists for 1,200- and 1,800 bit/sec full-duplex modems with sophisticated features such as on-line diagnostics as an integral part of the hardware.

The rapid growth of the packet-switching networks, which will also use SDLC, has created a need for high-speed, full-duplex modems. As large corporations implement internal networks, high-speed modems will continue to expand.

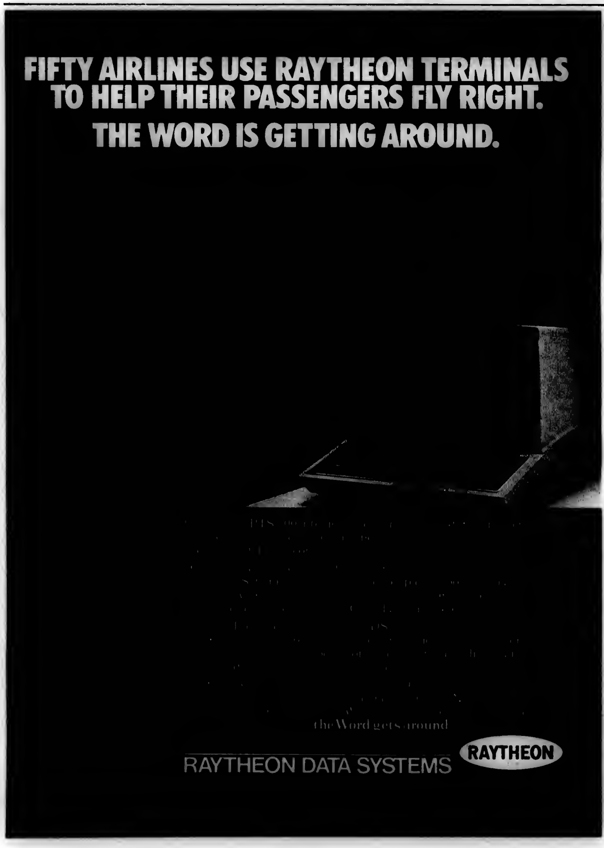
Terminal Area

Perhaps the greatest needs and problems exist in the terminal area. With well over one million terminals in use in the U.S., some means of gradually converting to SDLC is necessary.

In some networks, programmable node processors will be used to accept the input from bisynchronous and asynchronous terminals and reformat the data into SDLC-compatible form.

Terminals designed for the SDLC environment will incorporate an "SDLC front end" which provides the necessary formatting, insertion of command bits and error detection. Through the use of microprocessors and LSI, these SDLC terminals will cost little more than existing devices, but provide up to twice the system throughput.

Wickham is with Vantage Research. This article is based on a presentation given at the recent Western Electronics Show and Convention (Wescon).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Burroughs AE 501 Audit Entry Data Preparation Syatem

Has Program Generator

Burroughs Key-to-Cassette Bows

By Patrick Ward
Of the CW Staff

DETROIT – The AE 501 Audit Entry data preparation system is both the standard Burroughs data entry device from now on and a forerunner of the company's future data entry equipment, according to a Burroughs spokesman.

The stand-alone 16K device offers "more efficient, more productive and more controlled data entry than other types of data entry equipment," the spokesman said.

The system is designed to edit and validate data as it is keyed and then capture clean data on magnetic tape cassettes. The aim is to correct errors at the source and so reduce time-consuming verification runs at the host CPU, the spokesman explained.

The AE 501 can be used in either a centralized data entry pool or in user departments for distributed data entry. Synchronous or asynchronous communications capabilities are optional.

The system's paper output serves as both a journal record of the data recorded on tape and a logging medium for errors, Burroughs said.

Burroughs will supply data preparation software for the AE 501 that is paired with Burroughs Business Management Systems (BMS) software applications for use on the firm's B700 and B1700 CPUs.

On-Board Generator

The AE 501 has its own onboard program generator that allows the user to create his own programs, the spokesman said.

As the user prepares the file outline for the AE 501, he is concurrently preparing a system handler program on tape that allows the host computer to deal with the data the user has created on the AE 501.

Either the vendor's packages or user-written programs can allow for range checking, alphanumeric check digits and any desired number or level of batch totals. They can also provide a printed audit trail plus first-level management reports.

The single or dual magnetic tape cassettes on the AE 501 provide for firmware and software loading, data capture, data recall and batch transmission.

The AE 501 represents a "second-generation" version of Burroughs earlier AE 300 data entry device, the vendor said. The AE 501 has a 60 char./sec printer and built-in communications; the AE 300 has neither. The AE 300 also lacks the AE 501's onboard program generator.

Burroughs said it will continue to market the less expensive AE 300 for the time being, however.

The AE 501 costs $9,940 and leases at $295/mo. Immediate delivery is available, the firm said.

NCR Data Entry Device Uses Intel 8080

DAYTON, Ohio – The NCR 7200 Model I is a microprocessor-based data entry device designed for off-line data capture on tape cassettes.

NCR is currently aiming the 7200 at the firm's Century, 399 and 8200 CPU users who have fewer than four data entry devices, an NCR spokesman said.

The company said the 7200 is the first in a line of microprocessor-based data entry units. Other models, scheduled for introduction later, will include on-line inquiry capabilities.

Standard features on the basic Model I are: 128-character display buffer, detachable keypunch or typewriter-style keyboard with 10-key numeric pad, single cassette, Ascii 64-character set and 9-in. CRT screen.

Optional features are: 256-character display buffer, thermal printer interface, dual cassette, up to three check-digit verification schemes, up to four accumulators, operator lead-through, 512 bytes of additional memory for additional format storage and 128-character Ascii set.

The top half of the CRT screen can accommodate 128 characters. The lower half is used for operator messages or system status messages.

The 7200 currently offers asynchronous remote-batch communications and will support bisynchronous communications by the end of the year, NCR said. The company also plans to eventually offer Synchronous Data Link Control (SDLC) compatibility on the 7200.

The terminal can operate in eight modes: data entry, data verify, search, format entry, format verify, format display, transmit batch and receive batch.

Cassettes used with the terminal are Ansi-compatible and can be read into the full line of NCR computer systems, starting with the NCR 299 series up through the Century series. Each data cassette can store over 300,000 characters. The recording density is 800 bit/in.

The Intel 8080 microprocessor used in the terminal features a 5-μsec instruction cycle, four addressing modes and a repertoire of 78 hardware commands.

The microprocessor and its associated read-only and random-access memories direct all buffer allocation, data formatting and input/output traffic betweeen the terminal and its peripherals.

The basic Model I prices begin at $5,300 purchased and $140/mo rental.

Delivery begins in November.

Univac Adds Disk Drive For 90/30

BLUE BELL, Pa. – Univac has introduced a 57.9M byte/drive removable disk system for its 90/30 computer line, plugging the hole between its previous 28.9M-byte and 100M-byte removable disk models.

The disk drive, "new from the ground up," comes in two models, the 8418-94/95, which has the 57.9M-byte capacity, and the 8418-92/93.

The smaller 92/93 has the same capacity – 28.9M bytes – and price as the current 8416 disk, but has additional refinements and can be field-upgraded into a 57.9M-byte 94/95 model, a Univac spokesman said.

Univac is phasing out the 8416, he added.

Among the refinements the 8418 models offer are a better airflow system, more positive pressure seal of the disk pack area and better reliability and maintainability, Univac said.

Both of the 8418 models can be attached to the F1621 integrated disk adapter (IDA) in any combination and utilize the same F1216-02 disk pack. The 8418 can be intermixed with 8416 drives on the same IDA depending upon the OS/3 software level used.

The 8418's single-unit modularity facilitates the installation of additional drives to allow the user a growth path for mass storage expansion, Univac said.

Utilizing the Programmed Servo Offset technique, the 8418 can respond to a command to move the accessor a small amount from its designated track location.

This feature is useful in recovering marginal data due to servo or head alignment inaccuracies or small magnetic defects, the company said.

One Disk Spindle

Both models are housed in a cabinet with one disk spindle. The 8418-94/95 utilizes all 815 cylinders of the F1216-02 disk pack; the 8418-92/93 reads or writes data only on the outer 411 cylinders of the disk pack.

If more than four disk drives are attached to a 8418 subsystem, the T2408 IDA expansion feature is required. A maximum 8418 subsystem consists of eight disk drives.

The Univac 8418-92/93 rents for $385/mo including maintenance and sells for $14,880.

The 8418-94/95 drive rents for $545/mo including maintenance and can be purchased for $22,080.

The F1621-00 IDA feature rents for $300/mo including maintenance and sells for $12,000.

The F1216-02 disk pack rents for $25/mo and sells for $500.

First customer deliveries of the 8418s are scheduled in November for the 92/93 and March 1976 for the 94/95.

IBM 7090 User Group Forming

TERRE HAUTE, Ind. – Users interested in forming an independent IBM 7090/94/9411 users group can contact Terry Harris at Indiana State University's Department of Physics.

Harris would also welcome hearing from users who still have 7090-compatible programs in their archives.

"We installed a 7090 in 1973," Harris noted. "Except for some help from Purdue University during the installation, we have maintained it ourselves and have been very satisfied with its performance."

The university's Zip Code is 47809.

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ComputingPower Through an RJE Terminal

Through a Remote Job Entry terminal, you can utilize the power of Martin Marietta Data Systems' IBM 370/168 computers. The RJE approach offers some out-of-the-ordinary benefits for the company thinking of enhancing or acquiring a computer:

As Convenient as an In-House Machine

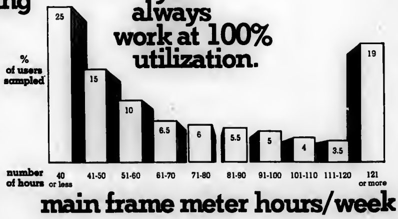
You handle the on-site RJE terminal card readers and printers just as you would your own machine. You can use video display keyboards instead, add tapes or use a small IBM computer at the terminal location. You get as much local processing as you want — batch or interactive — with planned overflow back to the MMDS computer centers. The connection is by way of the MMDS network, intermixing high and low speed data on high speed duplex lines. The network simplifies the handling of data processing for the decentralized company. The complex of large computers and high speed lines afford economies of scale and reliability.

as much local processing as you want.

The Elastic Configuration

A company's data processing load fluctuates from hour to hour, day to day, and week to week. The average computer, configured for the worst situation, is under half loaded. Not only does the load fluctuate; the configuration requirements change. A hidden source of under-utilization is the capacity (memory size, channels, line handling capability and peripheral devices) that exists to handle only exceptional jobs. When buying computer power through RJE terminal facilities, you always work at 100% utilization and your configuration is always the minimum required. Additionally, for those peak days or that exceptional program, you have at your disposal all the power and equipment you need. A modest in-house configuration handling your consistent volume, coupled with an RJE terminal for exceptional loads and job profiles, is often a happy combination.

you always work at 100% utilization.



A Technological Umbrella

For hardware reasons, a company may elect to handle part or all of its load through an RJE arrangement; developing additional systems or implementing its new strategy on the MMDS facility. This is a simple, flexible and economical way to move forward. The same case applies for the technology. MMDS has 50 technical development people working in the VS, TSO, IMS, CRJE and communications areas. The software environment they create and enhance is used by our clients, by us and by our parent company. It has to be effective and it has to be up-to-date. The use of an RJE terminal not only smooths load and configuration requirements for the in-house computer owner; it taps into up-to-date hardware, communications and systems software. It is a flexible, fully supported means of developing the company's computing plan without the normal hardware shuffling and software R&D.

capabilities snapshot

HARDWARE

MAIN FRAMES:

370/168's 360/50

370/145 CDC 6500

370/155 EAI 8400

DISKS:

2314, 3330–single and double density

Drums, Magnetic Tapes, Plotters, Microfilm

SOFTWARE

TSO IMS DBOMP

SVS/HASP

OS/MVT/HASP

DOS DOS/VS

Emulation Assembler

COBOL-ANS FORTRAN

PL/I RPG SNOBOL

Application Software

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You may be doing a lot of batch work now but be planning for conversion to real-time processing. Or your loads may be planned to move sharply. Perhaps you're centralizing or decentralizing your data processing arrangements. Owning your own equipment can be a considerable constraint in implementing your plans and renting equipment is expensive. In any case, continued shuffling of hardware is an unwelcome intrustion on management's time. To get the best price performance from IBM, you need the latest (and largest) equipment, but this may be in conflict with your needs, the economy of purchase ownership and the stability required for internal performance. Utilizing the MMDS computer/network utility keeps your options open into the future; avoids cash outlay; gives you the flexibility you need as your operation changes and develops; and affords the price performance benefits of large purchased machines and high speed lines.

keeps your options open!

Releases Cash for Systems Development

More and more, as some of the excitement falls away from the computer aided business systems area, the data processing executive is fighting for his budget. But now is the time that companies should be putting major effort into systems development: the software environment, the cost of computing equipment and the systems philosophy of interactive computing (with data base organization and distributive processing) are all coming together into a practicable technology for business systems implementation. Many computer set-ups, though, are locked into depreciated hardware and heavy on-going maintenance loads. Satisfying some or all of your computer power needs through terminal facilities can release significant cash for the system development budget. You don't have the same money tied up in hardware; you don't have the software technology R&D load; you get the economy of 100% machine and configuration utilization; and you get the economy of scale inherent in larger, up-to-date machines and faster lines.

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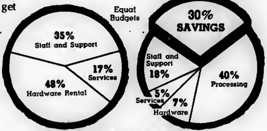

Example of in-house versus remote job entry computing costs.

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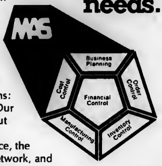
MMDS has been a pioneer in the field of off-the-shelf Modular Application Systems (MAS) development. Where relevant, MAS can be tailored to fit your exact needs; the systems are straight-forward and efficient to use; and their performance is proven in over 500 implementations. A special feature of the MMDS RJE terminal service is that these MAS systems are available at no cost for use on the MMDS computer/network facility (for use on a client's own computer, the cost works out at 10% to 20% of the estimated cost of in-house development depending on the amount of tailoring). Additionally, the convenience of handling a particular system (say, MAS Inventory Management or an IMS application) on a dedicated RJE facility — alongside the existing in-house machinery or networked into a remote subsidiary — is worthy of note. Again, this use of the RJE terminal facility unlocks the economies of utilization and scale as well as hardware flexibility into the future and the benefit of the technological umbrella. MAS, for example, is in use with IMS and other proprietary data management systems with facilities available for interactive processing.

tailored to fit your exact needs.



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For more information on our computer power services, MAS ranges, or systems and programming capabilities, please contact:

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New York Region (212) 541-4740	Mr. John Bately Hoskyns Systems, Inc. 75 Rockefeller Plaza New York, New York 10019
Great Lakes Region (716) 634-8210	Mr. James E. Feely Martin Marietta Data Systems Great Lakes Data Center P.O. Box 247 Buffalo, New York 14221
Southeast Region (305) 855-1050	Mr. Ellis M. Tidwell Martin Marietta Data Systems P.O. Box 5837, MP 169 Orlando, Florida 32805
Northeast Region (216) 228-5321	Mr. J. Chris Horrocks Martin Marietta Data Systems 14900 Edgewood Drive Lakewood, Ohio 44107
Midwest Region (312) 298-1247	Mr. Charles A. Erickson Martin Marietta Data Systems 200 E. Devon Avenue, Suite 115 Des Plaines, Illinois 60018
Rocky Mountain Region (303) 761-3781	Mr. Norwood L. Robb Martin Marietta Data Systems 400 Continental National Bank Bldg. Englewood, Colorado 80110
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Frequency Converters Fit 370s

DEER PARK, N.Y. – KW Control Systems has noise-reducing, enclosed 75 kVA, 415-Hz frequency converter units for IBM 370/165s and 370/168s.

The enclosed frequency converter units incorporate an IBM-approved 415-Hz frequency converter into a noise-reducing enclosure, both of which are manufactured by Anton Piller KG of West Germany.

Conforms to Standards

As a result of the noise reduction, the enclosed unit conforms with standards set forth by the National Bureau of Standards for computer room equipment. The unit is quieter than a disk drive or printer, KW said.

The units can be installed directly into the computer room. The unit measures approximately 71- by 26- by 60 in. and weighs 3,000 lbs.

Reduces Costs

The user can reduce his installation and operation costs by eliminating the need for a separate room for the frequency converter, decreasing the length of the high-frequency cable between the computer and frequency converter and improving the security of the installation by combining the system in one room, KW said.

The enclosed unit costs $21,780 vs. $16,800 for the standard, 415-Hz frequency converter. Delivery is quoted at four months by the firm at 151-17 W. Industry Court, 11729.

Hospital to Save $15,000/Year With IV Supply, Billing System

By Stephen L. Prieat

Special to Computerworld

BROCKTON, Mass. – Brockton Hospital has implemented an intravenous (IV) solution supply and billing system that not only cuts administrative time but will save the hospital an estimated $15,000/year in previously lost billings.

The former system required nurses to prepare a separate charge ticket each time an IV solution was taken from the floors' IV stock supply. Many times the nurse could not take the time to complete the charge ticket.

Many billings were completed incorrectly and could not be used for billing purposes. In general, the former system was not only tedious and time-consuming for nurses, but also resulted in lost IV revenue.

The new procedure is based on a modification of the NCR Inpatient Record Package running on the hospital's 32K NCR Century 200 computer.

Under the system, the DP center's 1,500 line/min printer produces a daily alphabetical patient printout for each nursing station.

This requires no special data entry because the data comes from the computer's daily inpatient record billing file, which is updated at 1 a.m. with the previous day's admissions, discharges and transfers.

The printouts reach the pharmacy before 8:30 a.m. seven days a week. A pharmacy aide then brings one to each nursing station's IV stock area. He removes the printout from the previous day and posts the new one.

Gummed Identification Labels

When a nurse requires an IV solution from stock, she pulls off the identification label on top of each solution bottle and sticks it on the printout next to the patient's name. (Patients admitted or transferred during the day must be initially handwritten onto the sheet.)

The pharmacy has prepared the gummed labels beforehand to identify the different IV solutions and has attached the labels to the top of the solution bottles before their delivery to the floor.

A pharmacy aide tallies the previous day's printout to determine the number of IV solutions used and how many need to be restocked to keep supplies at a predetermined level.

Since the aide knows how many solutions he delivers daily, his total tally also includes the number that were used and not noted on the printout. While some IV use still goes unrecorded, it is far less than before.

The pharmacy billing secretary then uses the previous day's printouts to determine the IV cost for each patient. Each nursing station sheet is then added up to reach a total IV cost, and the information is forwarded to the DP area.

The DP staff keypunches each patient's number, the date of the printout sheet, the hospital's cost for the IV solution used and the code for the particular solution. The computer calculates each patient's charge from the cost to the hospital.

The keypunching is done on an IBM 129 unit that accumulates the charges for each patient in a particular nursing station. When the data entry operator finishes keying in the individual patient records, he compares that total with the total charge computed by the pharmacy's billing secretary.

If the totals match, DP does not key-verify the punched cards. The used printout sheets then go back to the pharmacy for future reference.

The new IV supply and billing system saves valuable nursing time that can be devoted to additional patient care. The system has demonstrated to nurses that computers can assist them in their daily functions; they are enthusiastic in their praise for this new system.

The chief pharmacist estimates the new procedure will increase IV solution revenue by over $15,000/year by eliminating lost billing tickets.

The system has also uncovered deficiencies in the par levels of many nursing stations which cause one station to borrow from another floor or to make urgent requests for pharmacy to make unscheduled deliveries.

Thus, the new system eliminates unscheduled pharmacy deliveries and more closely monitors stock levels.

Priest is the manager of data systems at the Brockton Hospital, Brockton, Mass.

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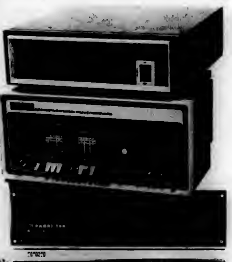

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Planning Helps DP Center Move 10 Miles in Two Days

NEWPORT BEACH, Calif. – Comprehensive planning helped Great Western Savings and Loan Association move its IBM 370/158-based data center 10 miles to a new building here over a two-day weekend, according to John Singleton, vice-president and manager of the Systems and Data Processing Division.

"What is perhaps even more significant is that, after having moved the entire facility, the first day of operation subsequent to the move was flawless – no hardware or software problems of any type," Singleton said.

"As a matter of fact, the first week of operation after the move was accomplished with a 98.2% on-line system uptime and a 100% reports distribution percentage," he said.

The challenge to the Great Western staff was to move all equipment and personnel in one weekend without interrupting normal on-line or batch production and without hiring outside consultants, other than the normal IBM and building contractor personnel, he said.

At 7:25 p.m. on July 17., after six months of planning, the "Power Off" switch was pressed, terminating eight years of operations at the firm's Santa Ana data center.

At 7:24 p.m. on July 18, IBM field engineers turned over the computer system to the Great Western staff for on-line system testing, Singleton said.

So, in less than 24 hours, a major large-scale on-line computer system was disassembled, moved, reassembled and operational, Singleton said.

Eight hours later, after successful on-line testing, the normal weekend production cycle was started – just 32 hours after system shutdown at Santa Ana.

Not a Small System

With 90 separate California branch offices, Great Western has one of the largest branch networks of any savings and loan association in the U.S.

Applications include on-line savings, loan, financial and management information systems which support a 350-terminal network 11 hours a day, five days a week.

The 1M-byte 370/158 handles an average of 60,000 on-line transaction/day with a peak daily workload of 100,000 transactions during quarterly reinvestment periods – all on the basis of a 2- to 5 sec terminal response time.

Peripheral equipment includes 20 IBM 3330 disk drives, three tape units, two high-speed printers and an IBM 3705 communications control unit.

The Move Plan

The key to the success of the data center relocation was, in the words of the responsible IBM field engineer, "the most comprehensive and well-prepared move plan I have ever seen."

The plan itself was the culmination of months of joint effort between Great Western and IBM. It tried to consider every conceivable aspect of the move with special emphasis on contingency alternatives and numerous intermediate measurable milestones.

Since the move plan covered not only the events during the actual move, but also considered necessary premove actions, several milestone schedules were developed from a general schedule covering the period February through July to a very detailed milestone schedule which addressed the actual move.

Detailed responsibility/contact lists were developed to establish premove, during-the-move and postmove planning and execution responsibility.

These lists were developed to eliminate duplication of effort and to insure effective coordination with a series of checks and balances among all parties involved.

Extensive documentation identified the exact location of every piece of furniture and equipment – both its location at the Santa Ana facility and at its new location.

All employees involved in the move received packets which described their responsibilities and provided detailed explanations of exactly what was to occur during the relocation weekend.

Narrative descriptions of all significant events reinforced the time-phased charts and bar graphs included in the plan.

Most Important Factor

Important as the actual plan was, it was subordinate to the value provided by the planning process itself, Singleton remarked.

This process was the vehicle which literally forced all parties involved to consider every imaginable detail associated with the premove, move and postmove requirements.

"Without this type of comprehensive analysis, a successful relocation could have only occurred through pure good fortune," Singleton said.

The planning process was conducted by defining end-point requirements – what Great Western wanted the new facility to be like; and by defining critical intermediate requirements (working backward from the end-point requirements to do what was necessary to achieve them).

"Worst case" planning, which involved constructing courses of action based on failure assumptions for all key intermediate milestones, also took place, as did a follow-up and reevaluation of all assigned tasks.

This planning cycle was not a "one-shot" approach, Singleton noted. The cycle was repeated many times until it was felt that every conceivable action necessary to insure a successful relocation had been accomplished.

A significant portion of the planning process was dedicated to premove testing, such as testing the new facility's air-conditioning capacity.

The Data Center relocation planning process took place within a "management by results" (MBR) framework.

MBR as applied to the Great Western DP environment consisted of:

- A project control system which provided for orderly project development and established an objective means through which users and corporate managers could measure project performance.
- A user education and communication system which minimized user/data processing conflicts.
- An individual commitment system through which work standards and goals were established and individual performance was measured.

The net result of the planning effort for the data center relocation within the MBR framework was the successful move of the Great Western data center in less than 24 hours.

Special message for 900 about-to-be DEC buyers.

For you 900 or so persons who are planning to buy a DEC system in the next two years, we heartily endorse your judgment. We have, in fact, three DEC system 10's in-house. But if you contact us now, before you close your deal, you have an excellent chance to improve your DEC system cost and operating picture.

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Mini/Mainframe Combo...Answer to Decentralization?

By Vic Farmer
Of the CW Staff

WASHINGTON, D.C. – The use of minicomputers alone in decentralized data processing has been said to be the wave of the future.

But a more effective answer to the centralization vs. decentralization question may be to combine minicomputers and larger mainframes in a way which would permit users to enjoy the best of both worlds, according to Robert L. Ashenhurst, who is with the Institute for Computer Research at the University of Chicago.

In the past, centralization was justified by both the technological cost-effectiveness of larger vs. smaller systems and the greater efficiency with which specialized operational support service could be organized where the system was used in batch mode with a limited variety of programming language capabilities.

But applications requiring interactive or on-line processing now tend to counter this trend, Ashenhurst said in a paper prepared for the IEEE Computer Society Conference held here recently.

In a technological sense, minicomputers tailored to special needs offer a cost-effective alternative when a wide range of individual user requirements of a number of different programming languages and different modes of operation are needed.

There is also a natural propensity of users to desire a system over which they exert more, rather than less, operation control, he added.

But there are problems, too, with the exclusive use of stand-alone minicomputers. The user faces the problem of how to develop and maintain applications without the common facilities and common support group characterizing the large computing center. Turnkey systems are one answer; however, often a turnkey system is almost, but not quite, what a user needs.

Too, there may be occasional needs for expanded facilities, which could not be cost-effective incorporated into the configuration in terms of amount of use, but the absence of which leads to considerable inefficiency, he said.

The answer cited most is to connect minis to a larger system so they can be tailored to specialized applications as desired, but also make use of shared facilities as appropriate, Ashenhurst said.

With the increased flexibility and lowered costs of communications interfaces, the added cost of interconnection, it is reasoned, is more than offset by the increased capability gained.

Nature of Interface

However, there is a question of the nature of the minicomputer interface and the specifications of the hardware/software configurations appropriate to it.

It seems unlikely that merely implementing the communications needed, and otherwise configuring both the minicomputer and the general-purpose system as they would be otherwise is sufficient, Ashenhurst said.

The Institute for Computer Research is exploring the interrelationships of minicomputer/mainframe in an attempt to answer such questions as:

- Should the general-purpose system be recognized as offering a third type of service, say, on-line support, in addition to the batch and interactive services it already gives?
- How should operating system functions be distributed between the minicomputer and the general-purpose system?
- How should the capabilities for applications processing, file management and communications management be distributed and shared?

The system developed at the Institute with support from the National Science Foundation is called Minicomputer Inter-

(Continued on Page 29)

Insurance Firm Finds

Upgrades in a Series Not Always Best Choice

LOS ANGELES Requiring more processing power, Signal Insurance Co. recently deviated from the typical pattern of upgrading from an IBM System/3 Model 10 to a larger Model 15 by installing a large minicomputer.

According to Larry B. Harvey, senior vice-president of Signal, "our new system is one of a few in the industry that just doesn't simply speed up our batch processing. It also permits us to interact directly with the system from anywhere in the company."

Signal's choice of a Hewlett-Packard 3000CX was the result of a task force study spearheaded by Harvey and the company's DP manager, Bruce Bauman.

"Our original choice," Bauman said, "was the traditional step-up to a larger System/3, the Model 15.

"The Model 15 was attractive because we thought our Model 10 programs would run on it while we were writing our new programs," he said.

But that approach, which required the use of the computer's recompile mode switch, made the computer's system console inoperative. To solve the console problem would have resulted in interim program changes and modifications to the operator control language.

The task force also decided the multiple programming capabilities of the System/3 would not be efficient for Signal's applications because of limitations in its operating system. Up to eight Signal applications will be handled concurrently on the HP 3000 vs. three on the Model 15.

If a program is too large for the HP 3000 main memory, it is segmented into logical lengths. The machine's architecture, in concert with its operating system, then manipulates the application program during execution.

Management of Signal's HP system is facilitated by the use of the mini's dual-disk system. Two 47M-byte moving-head drives, with 47 msec average access time, store the company's data base.

A fixed-head, 2.5M-byte, 8.7-msec average access disk enhances system management by providing fast transfer of programs and routines between main memory and disk storage.

The system also has two 1,600 bit/in. tape drives, a 1,250 line/min printer and 13 CRT terminals.

The Signal task force estimated the useful life of the HP 3000, in view of the company's anticipated growth and existing and contemplated programs, at five to seven years.

The company's System/3 Model 10 was installed in 1973 to absorb in-house the work of two service bureaus. "We simply emulated card procedures on a one-to-one basis," Bauman said. "Some of the programs ran well. Others ran poorly."

In addition to emulating the primary service bureau's program, subcontracting service bureau programs were converted. The latter programs, run on an IBM 360/20, processed data pertaining to four years' loss ratio carryforwards for agency experience reports. (Loss ratio is an insurance index comparing incurred losses to earned premiums, a key indicator of profitability.)

"Modifying programs became a programmatic nightmare," Bauman recalled. The task force was therefore initiated to examine all the options: a final program fix for the System/3, an upgrade and reprogram with a larger System/3 or, as was eventually decided, a switch to an independent system.

Corporate Reorganization

To ensure maximum utilization of its new system, another task force studied corporate reorganization possibilities. Several of its implemented recommendations resulted in streamlined report content and distribution.

For example, the policy services department, which maintains and updates policies, was physically removed from the underwriting department which evaluates and accepts risks. Each now receives reports confined only to its specific functions.

Another organizational change made the systems and procedures and DP departments responsible to the company's executive committee. Formerly both functions were the responsibility of the administrative services department.

Departmental interaction with the system, according to Bauman, allows decisions to be made faster and on the basis

(Continued on Page 29)

DPMA to Run New York Seminar

NEW YORK – Seminars to examine the status of minicomputers in commercial sectors will be sponsored by the Data Processing Management Association's (DPMA) New York chapter here on Oct. 23 and Nov. 20.

Titled "Minicomputers in Business – Today and Tomorrow," the programs provided by Mini-Computer Systems, Inc. will examine in detail the penetration of minicomputers in all types of users.

The programs have been developed under the direction of Walter T. Griffin, chairman of the New York chapter's Seminar Conference Committee. Griffin is assistant treasurer of The Seamen's Bank for Savings.

"We are witnessing a startling change in application of the minicomputer," Salvator Palazzo, chapter president, said.

"The minicomputer is being developed into an effective commercial tool dealing with such factors as rising costs, providing more timely and accurate information necessary for a successful business operation and generally assuring management that it is in more direct control of its DP destiny," he explained.

The Management of Mini-Computer Systems, Inc., headed by Donald L. Gross, president, and William R. Doniger, executive vice-president, will give an overview of the state of the art, emphasizing commercial usage and presenting a prognosis for near-future developments, a chapter spokesman said.

Hardware, peripherals and software in general use will be examined and there will be analysis of major commercial applications, the best methods of securing minicomputers and an analysis of financial elements.

There is a charge of $20. The chapter can be reached through P.O. Box 1406, FDR Station, 10022.

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Firm Finds Series Upgrade Not Always Best Choice

(Continued from Page 28)

of more recent data.

When evaluating new business, for example, underwriting personnel gain immediate access to current agency loss ratio reports to determine the quality of an agency relationship. Awkward, hardcopy binders, updated only quarterly, were used previously.

Edit and Audit Controls

With enlarged disk capacity, an extensive set of edit and audit controls is now employed. When entering new business, data elements are automatically checked to verify they are sensible and complete. This ensures that codes are correct and that Signal is authorized to sell the line in a particular state.

In collections, the former System/3 mode emulated traditional tub-file procedures. Pending payment cards were manually pulled from the file when checks arrived and cards were forwarded to the DP department for accounts receivable updating.

Now collections personnel directly enter cash amounts received, as accounts receivable are adjusted and audit trails established.

Applications, currently 20% cut over, will be fully converted to the HP 3000CX by the fourth quarter of this year. They include actuarial studies; agency experience records, including four-year carryforward of loss ratios by line, branch and agency; claims; collections; accounts receivable; policy services; and general agency management.

Tab Data Entry Unit Microprocessor-Controlled

PALO ALTO, Calif. – Tab Products Co. has a microprocessor-controlled 80-column punched-card entry device called the Tab 501 data entry microprocessor.

Tab said the microprocessor incorporating an optional RS-232C interface, "gives the unit operating and interfacing capabilities unique in punched-card data entry systems."

Capable of data transmission through modem or cable, the unit can be tied into virtually any type of data entry or processing system, Tab said.

Additionally, according to the company, the 501 can read, punch, print, verify and interpret either on-line or off-line, depending on the selection of options.

Features of the 501 include up to 220 columns of constants from memory, up to 28 program levels with automatic sequencing, instant verification, automatic error correction and high-speed character duplication.

"Because of the inherent flexibility of the microprocessor, we can configure this machine to meet virtually any application requirements," Tab claimed. "In other words, we can and will actively solicit – and handle – 'specials' easily and inexpensively."

A straight keypunch with microprocessor is priced at $6,285; the RS-232C interface is $1,400; and a print/interpret function is $1,100 from the firm at 2690 Hanover St., 94304.

Combo Offers Answer To Decentralization

(Continued from Page 28)

facing Support System (Miss) and is an example of a hierarchical system.

Interaction of user-owned minis with the campus computation center facilities is channeled through an intermediate level system termed Minicomputer Operation Monitor (MOM), he said.

The existence of the intermediate level is an important component in the design philosophy – it is dedicated to the mini support function, and has file, input/output and communications monitoring capabilities only, with no provision for user applications processing, he said.

Applications are more appropriately done at either the mini or the general-purpose facility.

Functionally Specialized

The intermediate level is thus functionally specialized in the system sense, and this has implications for reliability and efficiency of the totality of support services available to the mini users, he added.

Miss users can operate minis either as terminals or as independently or dependently operating processors – most minis conveniently permit both modes to exist together (foreground/background), he explained.

Minicomputers may also be minimally configured and can be used effectively with no operating system other than the communications software interfacing to MOM.

The system is designed so a variety of minis are supported in a uniform way by the MOM system implemented on a medium-scale Digital Equipment Corp. PDP-11/45 configuration connected to an IBM 370/168 at the university computation center.

It is believed the Miss facility enhances the use of minis and permits applications to be easily and naturally expanded, he said. But this is done in a manner coordinated with, not independent of, the services offered by centralized facilities.

Course on Minis Offered

NASHVILLE, Tenn. – "Minicomputers," a two-day course, will be offered on Oct. 17 to 18 at the Sarrat Student Center of Vanderbilt University here.

The course, designed to provide state-of-the-art information on minicomputer systems, is cosponsored by the Institute of Electrical and Electronics Engineers' (IEEE) Nashville section.

The lecturer is Dr. John Allen III, associate professor of mechanical engineering and computer sciences at the University of Texas.

The registration fee, which includes a copy of the course material and two luncheons, is $105 for IEEE members, $55 for IEEE student members and $125 for nonmembers.

The IEEE Educational Registrar is at 445 Hoes Lane, Piscataway, N.J. 08854.

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While at the GSA, Mr. Miller authored many solicitation documents and reviewed RFPs submitted by other Federal agencies. He was the project officer for various mandatory requirements contract procurements including ones for tape and disk drives, plug-compatible memories and remote computing services.

Mr. Miller is the President of Government Sales Consultants, Inc., a firm that offers consulting services and seminars to computer-related companies and Government agencies seeking help in ADP procurement.

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In addition to GSCIs now-famous 3-day seminar overview — "ADP Procurement in the Federal Government", courses on specific topics are being presented on a regular basis. The current course schedule now includes such topics as:

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- ADP Schedules
- The Government Contracting Team
- Negotiations
- Introduction to Government Organization

New courses will be added and plans are underway to have them available in most major cities.

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Hospital Reporting System Uses NCR 399

NEW YORK – NCR Corp. has a hospital reporting system that uses a low-cost minicomputer to handle a wide range of government reporting requirements.

The Medi-Scan hospital reporting system is designed to help the nation's 8,000 hospitals meet reporting requirements generated by the government, NCR said.

The cost of the review activities, when assisted by Medi-Scan, will be "significantly under the $7 level, according to preliminary cost-comparison and cost-effectiveness studies," the company added.

Medi-Scan uses the NCR 399 and is designed for small as well as larger hospitals. The system includes five software modules which can be implemented one at a time.

The modules include a utilization review module; a medical audit, justification of admission and validation of diagnosis module; an infectious disease profile module; a tumor registry module; and a pharmacy module.

The utilization review module produces 18 daily reports and 16 monthly reports. It is designed to comply with federal standards relating to utilization review conducted on patients whose care is reimbursed by Medicare, Medicaid and other federal programs.

Among other things, utilization review reports and procedures determine whether a patient should be in the hospital and for how long, NCR said. Medi-Scan also provides daily, monthly, quarterly, semi-annual and annual reports of a hospital's utilization review program.

The utilization review module is now available for customer delivery.

The medical audit, justification of admission and validation of diagnosis module complies with medical audit requirements now required of hospitals by health care regulatory agencies and will comply with emerging federal requirements, NCR said.

DEC Adds MS800 for Offices

MAYNARD, Mass. – The System 800 from Digital Equipment Corp. has been designed for office work and is housed in a desk configuration.

The system, also known as the MS800, incorporates a PDP-8/A minicomputer and a dual floppy disk drive unit. It operates under OS/8 system software.

The MS800 features power fail/auto restart, a real timeclock and both serial and parallel I/O. A selection of DEC terminals, including the VT50 series of CRT terminals and the LA36 series of Decwriter terminal printers, is available for the system.

Designed as a stand-alone system, the MS800 can be used for decentralized data processing. The system can also be used as a remote station in a computer network.

The MS800 is available with 8K words of memory at $8,995; 16K word sells for $9,995.

Mini Measures License Hopefuls In Road Tests

HAMPTON, Va. – Prospective drivers going for road tests no longer have to fear that the tester got up on the wrong side of the bed.

Today it's just driver against minicomputer.

The Department of Motor Vehicles (DMV) here has installed a federally funded automated driving range prototype for road tests for operators' licenses.

Built around a Data General 1200, the system relies on sensors embedded in the pavement, a transmitter and pneumatic tubes to give an objective judgment of an individual's ability to operate a motor vehicle.

The driving course is four-tenths of a mile long; six cars can be handled at one time, according to C.R. Swift, branch manager.

The DMV has six transmitters, each operating on a separate frequency. A transmitter is attached to an applicant's car before he starts the course.

As he drives, the sensors in the road react to the frequency put out by the transmitter, allowing the mini to determine which car is on what part of the course at any given time and the speed at which the vehicle is traveling.

Pneumatic signal hoses around the periphery of the course and down the center line are programmed to signal if turns are made wide, short or across the center or if driving violations were made, Swift said.

The course also includes traffic signals, stop signs and flashing lights.

The course has been a success so far, Swift said. In the first nine months of operation, only 12% to 13% of the applicants failed the test, compared with nearly 20% for the conventional test.

The only problem encountered so far, he said, occurred when lightning struck a radio tower next to the course. The current traveled through the ground and was absorbed by the electronics, which were severely damaged.

The DMV is working on ways to alleviate this problem, Swift noted, since the tower is regularly hit.

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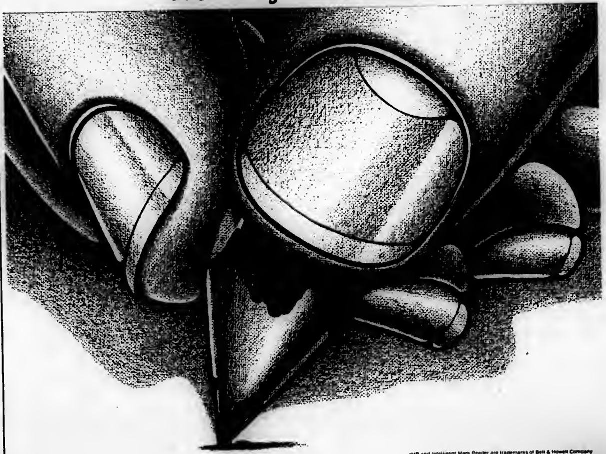

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The world of EDP is caught up in a continuous revolution It's only 24 years since the first business computer made its appearance, and we've gone from tubes, batch processing and single site giants to multiprogramming, time sharing, data communications, giant minicomputers and hundreds of other technological innovations that were unheard of only recently Keeping up with this revolution is difficult, to say the least And that's why we've created the EDP Seminar Series

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Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned

We've selected leading experts from around the country to guide each of our Seminars They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall What you learn will benefit your company, your installation, and you

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems Their performance, evaluation, measurement, and improvement* will lead this two day seminar on measurement techniques designed to save your installation money As well as system performance at your own installation topics covered include Criteria for quantifying performance pencil and paper analysis of a system Benchmarking techniques, Realtime Batch and interactive time sharing systems

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250

Wash., D.C.	**Marriott at Wash. Int'l. Airport**	**Oct. 20-21**
Chicago	**Hyatt Regency O'Hare**	**Oct. 27-28**
San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**

How to Increase Programming Productivity

John W Brackett, PhD, Vice President of SofTech, Inc , will lead this two day seminar for technical managers on the state of the art of Software Engineering Under his direction you will learn how to create more precise and visible analysis and design, reduce integration problems, improve software reliability, incorporate visible outputs into the software development cycle, increase programmer productivity, and improve programming management methods Topics covered include Structured programming, Top down analysis, design, implementation, and Chief Programmer teams

Cost for the entire seminar, including continental breakfasts luncheons, and all course materials is $300 Additional registrants from the same company are charged only $250

New York	**St. Moritz**	**Oct. 6-7**
San Francisco	**Berkeley Marriott**	**Nov. 10-11**

Data Base Design

Given in association with Leo J Cohen and Performance Development Corporation this three day seminar is a package independent examination of the techniques required for the design of effective data base systems The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more

Cost for the seminar, including course materials continental breakfasts and luncheons is $350 Additional registrants from the same company qualify for a reduced rate of $300

Denver	**Denver Hilton**	**Dec. 1-3**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N Freed, a nationally known lawyer, author and educator in the field of computer law you'll learn how to increase your advantage in dealing with vendors that supply your installation As well as practical discussion and review of your own contracts, subject areas covered in this 2½ day seminar include Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325 Additional registrants from the same company are charged only $275

New York	**Summit Hotel**	**Oct. 22-24**
San Francisco	**Hyatt Regency San Francisco**	**Nov. 12-14**
Chicago	**Hyatt Regency O'Hare**	**Nov. 19-21**

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr Dixon Doll, the nationally recognized teleprocessing consultant will lead this two day seminar on the newest advances in data communications The course covers areas like SDLC, HiD LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350 Additional registrants from the same company qualify for the reduced rate of $300

New York	**St. Moritz**	**Oct. 13-14**
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Dallas	**Hilton Inn**	**Nov. 10-11**
Miami	**Marriott Miami Beach**	**Nov. 17-18**

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr Dixon Doll, this course is a follow up to course #1010 Special emphasis is given to techniques that minimize operating costs in commercial data communications networks This three day seminar covers procedures, approaches, and algorithms for evaluating and cost optimizing network operations Total cost, including an extensive set of customized course materials, is $450 Additional registrants from the same company qualify for a reduced rate of $400

Miami	**Holiday Inn Airport Lakes**	**Dec. 1-3**

How to Draft Effective Legal Agreements

This one day seminar is a complete workshop for non legal, technical people who may be called upon to draft legal agreements for their company Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers

Cost for the seminar, including luncheon and a complete workbook on the subject, is $135

New York	**St. Moritz**	**Oct. 8**
Boston	**Sheraton**	**Oct. 15**

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CI Notes

McGurk to Run for Congress

LOS ANGELES Dan L McGurk, who until May of this year was president of the Computer Industry Association (CIA), will run as a Republican for the congressional seat now occupied by Barry Goldwater Jr (R-Calif.).

Goldwater, a conservative who has become identified with regulating the collection of personal information by both governnment and business, will challenge Sen. John V Tunney, a Democrat, for his Senate seat in 1976, it has been reported

Lee Stitzenberger resigned his post as CIA assistant director a few weeks ago to become McGurk's campaign manager, CIA President Jack Biddle confirmed.

McGurk, who joined Scientific Data Systems in 1964 as vice-president of marketing, became president and chief operating officer of the firm in December 1969, when it became Xerox Data Systems (XDS)

He left XDS in October 1970 and went into consulting. In July 1972, he became the first CIA president.

A West Point graduate and Rhodes Scholar, McGurk also holds a B.A. and M.A. in economics, political science and philosophy from Oxford University

Pertec-CMC Merger On Again

LOS ANGELES Pertec Corp. and Computer Machinery Corp. (CMC) of Marina Del Rey have signed a letter of intent to merge.

According to the agreement, Pertec will swap 1.8 million of its shares, valued at about $8 million, for all of CMC's shares of common stock which amount to $5.2 million.

Before the deal goes through, CMC's business and financial condition must be audited, its bank loan restructured and approval must be voted by stockholders of both firms.

Earlier merger discussions were terminated Aug 27 but, according to a Pertec spokesman, "recent developments made it appropriate to reevaluate the positions taken by both companies."

CMC reported a first-half loss of $802,000, although last year's revenues were $55 million. Pertec reported revenues of $48 million in 1974

Judge Upholds IBM Trial Schedule

LOS ANGELES Judge Ray W McNichols has upheld the trial schedule of plaintiffs whose cases against IBM were consolidated for pretrial purposes

McNichols also said he stands by his recommendations to a multidistrict panel that the Sanders case be remanded to New Hampshire

McNichols granted IBM permission to conduct further discovery regarding Forro Precision, Inc., which has admitted destroying "copies" of documents since the pretrial hearings

This is a potentially serious matter, or it could be nothing, an IBM attorney observed.

In upholding the trial schedule, McNichols added that if something occurs that would make a serious change in the timetable, he would reconsider the schedule

The next hearing is scheduled here Oct. 28

Amdahl Eyes Government Business

WASHINGTON, D.C. Amdahl Corp has announced the opening of a regional sales and service office here to bring word of its 470V/6 computer system to potential users in the area, principally government agencies

The office is at 5454 Wisconsin Ave., 20015

Plan Software Modifications

T/S Firms See 5100 Boosting Business

By Molly Upton
Of the CW Staff

Time-sharing firms generally think IBM's recently introduced 5100 will increase their business, and several have announced plans to modify their software for use on the system.

A *Computerworld* survey of seven time-sharing firms offering APL and/or Basic found four expecting an increase in business as a result of IBM sales of 5100s.

Two firms said they foresee no change, while one indicated a decline is possible

The majority of firms said most of their customers require the facilities of large systems, such as data bases, which they said the 5100 would not replace.

I.P. Sharpe Associates, Time-Sharing Resources, Inc. and Computer Sharing Services, Inc. indicated they are thinking of tailoring some of their existing APL software for the 5100.

The 5100 includes Basic and APL interpreters, a communications capability and up to 64K bytes of main storage [CW, Sept. 17]

Sharpe, Time-Sharing Resources, and another firm, APL Services, Inc. foresee linking the 5100 to their systems, which should expand their customer bases, they said.

"The net effect will be positive for Sharpe," Josef Schengili, director of marketing, said.

"Although there will be some work done on our system that will be transferred to the 5100, on the other hand I see a certain number of applications that will now become viable with the 5100 and communications to a large computer and data bases," he explained.

These new applications include order entry preprocessed on the 5100, stored on its cartridge and then sent to the time-sharing computer, Schengili said. This would eliminate many of the line charges, he observed

Sharpe is recommending the 5100 to some clients because it could save them some money, he added.

'Excellent Extension'

Joel Weisenfeld, vice-president of marketing for Time-Sharing Resources, said his firm has already decided to lease a 5100.

"We feel it is an excellent extension of our time-sharing services. The IBM unit can benefit our present customers as well as a new audience we couldn't service well previously," he said.

Typical of the new market he sees evolving are certified public accounts, who want applications such as accounts receivable and payable that were previously unfeasible to do on-line.

With IBM figuring to sell 10,000 units by the end of this year, the 5100 should build a need for APL, Weisenfeld said. When these initial customers outgrow the 5100, they will become time-sharing users, he commented

Time-Sharing Resources, based in Great Neck, N.Y., specializes in financial modeling, inventory control and statistics, about 80% of its customers are large companies.

Speaking of the possibility of offering packages for the 5100, Weisenfeld said, "APL is our business. Wherever we can lend support for it, we intend to."

(Continued on Page 34)

Univac to Spend Coming Months Mulling Takeover of Xerox Base

By Nancy French
Of the CW Staff

BLUE BELL, Pa. Univac said it is considering taking over Xerox Corp.'s Data Systems Division base of leased and purchased equipment in both the U.S. and abroad and will announce a final decision in 30 to 60 days.

In a statement issued over the Dow Jones wire, Univac said the firm was "reviewing the feasibility and economics of Sperry Univac's assumption of the obligations to service, maintain and support the Xerox Data Systems' customer base. It is too early to forecast the outcome of this review"

A Xerox spokesman said the firm could make no comment "in the middle of the negotiations"

While industry sources point out Univac and Xerox equipment have no particular architectural affinity, one said the two manufacturers did tend to go after the same customers the more technical users and "it could be a nice fit."

With 10% of the market share, Univac is the second largest computer mainframe company after IBM and the "most logical" computer mainframer to take on the Xerox user base, several different industry sources noted

Success With RCA Base

Although a Univac spokesman protested it is "far too early to say whether the firm would attempt to integrate Xerox users into an upward migration to Univac gear" Univac has been quite successful with the RCA user base it acquired on Jan 1, 1972

Of 500 original RCA users, 10% have installed or have ordered Univac mainframes. Of these new Univac mainframe users customers Univac never would have gotten any other way, the spokesman agreed 32% chose systems in the 1100 series. The remaining 68% chose 9000 or 90 series equipment

In addition, the firm has delivered a variety of tapes and disks for use on their users' Series 70 equipment, he said

Purchased three and one half years ago for $120 million, the RCA user base is still bringing in about $5 million/mo in equipment rental, according to estimates maintained by James Peacock, editor of *EDP Industry Report*

Market Share Boost

The RCA user base increased Univac's market share from an estimated 5% or 6% to about 10%

Acquiring the Xerox data base, estimated by industry sources at about 1,200 mainframes, could boost that share another percentage point Peacock speculated that, while the two are dissimilar architecturally, Univac's 1100 series or even the Series 90 could offer Xerox users a logical upgrade route

Perhaps Univac officials see a link between Xerox users and the new equipment scheduled for announcement in Minneapolis this week, one source suggested.

At any rate, Univac appears to be in a rather strong negotiating position it only by default, he added

Several other firms have "talked" with Xerox about such an acquisition, and at least one Hewlett-Packard has announced it isn't interested

Out of Work, But Not Hurting

By a CW Staff Writer

EL SEGUNDO, Calif Xerox Data Systems Division employees out of jobs as a result of the company's decision to bow out of the mainframe business [CW, Sept 17] have begun receiving what may be the most handsome severance benefits yet heard of in the computer industry

Rather than receiving a lump-sum severance check with their pink slips, employees are being placed on "salary continuation"

"Salary continuation is just like being on the payroll in terms of benefits," a Xerox spokesman explained. "The employee gets the same income and the same health insurance benefits, for example. The only difference is he has no duties" and does not have to report for work

The only responsibility a person on salary continuation has is to report in when he gets another job. At that time his salary is terminated

Based on Age, Length of Service

Duration of salary continuation is based on age as well as length of service, assuming the older the employee, the more difficulty he will have finding another job

Employees with four years' service who are less than 40 years old are receiving salary continuation for four months. Four years' service assures the employee between 40 and 50 years old of six months' continued salary and those between 50 and 60 with eight months' salary

For service of at least one year but less than four, the employee under 40 is receiving two months' salary continuation

The same length of service is earning the employee from 40 to 50 years of age three months' salary and the employee over 50, four months' salary continuation

Employees with the company eight years or more are receiving six, nine and 12 months's salary continuation if they are under 40, between 40 and 50 or over 50, respectively

As for how the firm ensures an employee doesn't try to continue receiving his Xerox salary at the same time he is employed elsewhere, the spokesman explained, "we think employees appreciate the benefits of the program and are willing to comply with its terms."

No Loss in Seniority

If business changes in a year or so, and an employee returns to Xerox Corp., he will lose none of his seniority with the firm, he explained.

"If a person has always longed for some change of life-style and wanted the breathing room and economic freedom to do it, there it is," the spokesman said. On the other hand, he added, it's not pleasant to be looking for a job in a recession.

The placement office set up in the Imperial Bank building here to help laid-off employees find other jobs has received many calls from potential employers nationwide, he said. However, no figures are yet available to indicate how successful it has been.

With 4006-1 Terminal

Tektronix Aiming at First-Time Graphics Users

SAN FRANCISCO With the introduction here of the 4006-1 graphics terminal, Tektronix, Inc has given its recently reorganized end-user and OEM divisions ammunition to expand their markets to first-time graphics users.

Tektronix' traditional market areas have been the innovators, scientists and engineers, explained Howard Mikesell, general manager of the Information Display Products Division, an end-user marketing unit.

Now, with the 4006-1, which sells for $2,995, about $1,000 less than the firm's previous bottom-of-the-line product, Mikesell intends to introduce graphics capability to people such as corporate management, the educational market and manufacturing, he said

A key element of Tektronix' move toward the first-time graphics user is the Interactive Graphing package, designed to allow the user to create graphics in plain English The package sells for $1,000 and is also usable on the firm's other terminals, Mikesell said

The price of the 4006-1 allows Tektronix to aim it at the high end of the alphanumeric market, Mikesell commented. "The user can almost have graphics for free," he said.

Tektronix also unveiled its 4923 digital cartridge tape reader, which sells for $1,895. The firm made the drive mechanism to handle the 3M Co cartridge, he said, noting this is one of its first vertical integration efforts.

In the past, the firm often has not made the exact product the OEM wanted, he said. "We did not address or serve the market as it deserved," he added.

OEM Division

The Information Display OEM Division, headed by Jon Reed, was created so the firm could remedy that problem, Mikesell said

Tektronix OEM business in the past year has been declining, which Mikesell attributed to the economy. However, he added, it has begun to pick up sharply.

Increasing OEM business means getting more Tektronix direct-view storage tubes out in the marketplace, he said, explaining increased exposure of its screen is expected to mean increased demand.

In addition, marketing to OEMs enables Tektronix to reach markets it would not sell to directly, he said.

The direct-view storage tube has no buffer to refresh and allows the use of graphics with a smaller memory allotment than if the screen were refreshed, a spokesman said

User Division

Another division formed as a result of the recent reorganization is the Information Display Systems Division, to address the user who needs systems integration and support, Mikesell explained.

The Information Products Group in 1975 had sales of $48.8 million, about 15% of Tektronix' revenues and a 108% improvement over the year before.

In October the group will consolidate its activity in a new building in Wilsonville, Ore., replacing about six separate locations.

Since Tektronix introduced its first graphics terminal in 1970, the 4002A for $10,000, it has been striving to show and convince users of benefits of graphics. Now users and the competition are convinced, Mikesell said.

In 1970, before Tektronix entered the field, a graphics terminal cost about $50,000, he said.

Adapso Sets Topics

SAN DIEGO – The annual meeting of the Association of Data Processing Service Organizations (Adapso) here next month will highlight changes in the marketplace and in technology itself, especially the challenges presented by the mini and microcomputer; views for capital opportunities; and the development of computer people.

Scheduled for Oct. 21-24 at the Sheraton Harbor Island Hotel, the conference has been formatted to provide general sessions of broad appeal coupled with concurrent sessions tailored to the specific needs of Adapso members in the data center section, the software industry association and the remote-processing services section.

For additional information and registration forms, contact Adapso at 210 Summit Ave., Montvale, N.J. 07645.

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IBM 5100 Will Boost Business

(Continued from Page 33)

Scientific Time Sharing of Bethesda, Md., also plans to offer software for the 5100

Dan Dyer, the firm's president, explained most people would probably get the APL option because it only cost $2,000.

Once they get through the first 10 pages in the APL handbook, the use of APL will "take off. There is no doubt which language people will prefer once they've tried both," he said.

After developing a few "personal applications, they will reach a level where they have confidence in using APL for major applications," he added. Dyer has already placed his order for a 5100.

Positive Integration

Joel Lamb, president of APL Services in Trenton, N.J., remarked that, although he has not yet seen the 5100, he expects to integrate it in a positive manner.

"It might open up a whole new market," of users who could perform most processing on the 5100 but would occasionally need a data base, he said.

The 5100 should not detract from APL Services' customer base, he said, which is now generally composed of network-oriented companies and those needing data base capabilities, such as airlines and financial institutions.

As Lamb sees the 5100, its principal market should be the individual engineer-type problem solver.

If the 5100 had come out three years ago, Lamb would have reacted differently, he observed, because APL Services was then more oriented toward the individual user.

"Our move toward larger users was not clairvoyance on our part, but the result of demands of the marketplace," he said. In addition, "most of our users depend on unique aspects we've incorporated into APL," Lamb added.

No Impact at All

Thomas O'Rourke, president of Tymshare, said he sees no impact on his business, which consists of larger firms using data bases and more sophisticated software tools such as forecasting.

The time-sharing market for the single engineer "pretty well dried up in the early '70s" and was heavily invaded by minicomputers, he said.

HDR Systems, Inc. of Omaha, Neb., could experience a net loss as a result of the 5100, according to Robert Gustafson, manager of marketing.

HDR serves both high schools and universities, he explained, although most of its business is in the commercial sector. Doing some mental calculations, he surmised the basic Model 5100 could be leased on a third-party basis at around $250/mo, which is approximately the same as HDR's port and terminal charges.

For "quick and dirty" learnings of Basic in the education market, the cost per month might be close, he said. The empirical math customers, however, will stay with time-sharing, he predicted.

Computer Sharing Services of Denver is not worried at the moment about the 5100, Bud O'Leary, marketing manager, said.

The 5100 could possibly impact its customers that do not have large core requirements, he observed, but time-sharing users are generally tending to use the core available.

Theoretical engineers comprise a maximum of 25% of his firm's business, he said, adding most of the business is in Basic rather than APL.

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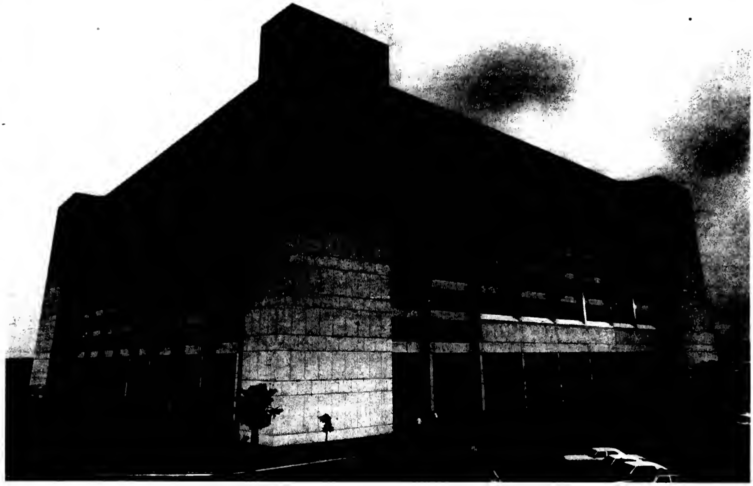

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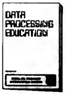

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Age of 'Build-It-Yourself' Micros Arrives at Wescon

By Molly Upton
Of the CW Staff

SAN FRANCISCO The age of the "build-it-yourself" microcomputer appears to be here

Not only did more than 800 people attend the session entitled "Microcomputers How Do I Get Started?" at the Western Electronic Show and Convention (Wescon) here recently, but several booths offering everything from a $20 microprocessor chip to microcomputer kits were besieged with inquiries.

The California silicon houses were conspicuous in their absence from the floor, although a couple of distributors were attempting to field questions.

MOS Technology, Inc. set the pace with its $20, 8-bit MCS6501, which is compatible with Motorola's 6800, the firm said.

The firm offers five microprocessors, all of which are software-compatible with one another.

For $25, one can buy the MCS6502, which has an on-board clock. Both units are 40 pins

MOS Technology has been making chips for calculators and is interested in selling to the individual experimenter as well as OEMs, according to Jerry Holdt, product manager. The firm is at 950 Rittenhouse Road, Norristown, Pa. 19401.

Jolt With RAM

For those who might want more than a single processor chip, Microcomputer Associates, Inc. uses MOS Technology's chip in a kit called Jolt which sells for $249.

The kit includes a static memory accommodating 512 bytes of user random-access memory (RAM) and a teletypewriter or EIA interface, along with Debugger/Monitor (Demon) software, the firm said.

The kit also has 16 programmable input/output lines. Assembly can be completed within three hours, the firm said.

CW Photo by M. Upton

General Instrument Corp. opened the door on its Gemini micro.

A card with 4K RAM costs $265 unassembled. Microcomputer Associates has other kits for I/O, power supply universal cards and accessories, The firm is at 111 Main St., Los Altos, Calif. 94022.

Mostek sells its F8 kit for $297 including an 8-bit processor, a read-only memory (ROM) and a printed circuit board. The user supplies resistors and capacitors.

Mostek is at 1215 W. Crosby Road, Carrollton, Texas 75006.

General Instrument Corp. showed a prototype of its Gemini microcomputer that has 8K RAM and sells for $3,500. It can handle up to 65K, according to the firm, which added it expects to market the unit in process control and instrumentation environments.

Data I/O is bringing out a portable program duplicator for programmable read-only memories (Prom) and an emulator which looks like a hand-held calculator.

The two units will sell for a combined price of about $1,000, Dick Woods, area manager, said.

Single-Chip Micro Available to Market

SAN FRANCISCO – General Instrument Corp. has begun taking orders for its CP-1600, which it hailed as the first single-chip, N-channel 16-bit microprocessor.

The 40-pin unit sells for $99 in single quantities and for $40 in quantities of 100.

The chip uses eight 16-bit registers.

Although the firm announced the chip last February, it previously was committed to selling it only to Honeywell for use in process control applications, according to Frank G. Hickey, president.

General Instrument plans to introduce a programmable interface-controller chip in January.

Software support for the CP-1600 will include on-line debug test equipment, simulators, assemblers and reloading linking loaders as well as utility programs, Hickey said.

The firm also plans to make available a library of application subroutines and a language generation package.

General Instrument Microelectronics is at 600 W. John St., Hicksville, N.Y. 11802.

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Florida financial institution seeks ambitious individual experienced in IBM DOS/US and TASKMASTER. Able in using this monitor to combine efficient analysis and programming while addressing the needs of on-line users. Candidate should have two years minimum direct experience in designing and coding application program modules with in-depth understanding of TASKMASTER internals. Bank familiarity, programmable frontends W/D BTAM, and SANDERS terminals is preferred.

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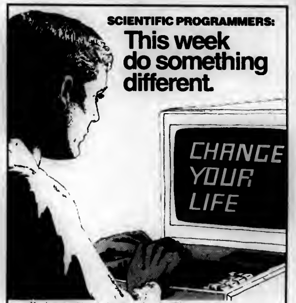

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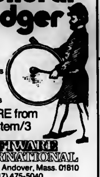

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Blue Shield of Massachusetts intends to issue an RFP on October 1, 1975 for the implementation, operation and continuing support of the data processing system and any necessary communication components of the Part B Medicare Claims Processing System for the State of Massachusetts. The contract period is for a six month implementation period plus a two (2) years operational period with an option for one (1) additional year. Requests for copies of the RFP should be addressed to:

Kenneth G. Hayes
Project Director
Systems Planning Division
Blue Shield of Massachusetts, Incorporated
Post Office Box 2187
Boston, Massachusetts 02106

Information regarding this procurement can be obtained by calling Mr. Hayes at (517) 357-8519.
Seperate technical and price proposals are required on or before 10 a.m. E.S.T., December 1, 1975

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Decline Expected

On-Line Systems Quarter Income Down

PITTSBURGH, Pa. – On-Line Systems, Inc. reported financial performance for the three months ended July 31 was down from the year-ago period.

Net earnings of $59,000 or 7 cents a share for the company's first 1975 quarter were down from the $427,000 or 51 cents a share posted in the same year-ago period.

The decline was anticipated as early as March in a letter to stockholders in which the firm attributed poor performance to a temporary dip in government contract revenue, a spokesman said.

Last year's earnings were greatly increased by a short-term contract with the Federal Energy Administration, a spokesman said.

That contract has since expired and, although the firm said it has signed a "sizable" pact with the Department of Health, Education and Welfare's Office of Education, revenues will not affect first-quarter earnings.

On-Line Systems posted revenues for the quarter at $2.2 million compared with $2.9 million in the same year-ago period.

Graham '75 Profit Margin Narrowed; Increase in Materials Cost Cited

GRAHAM, Texas – Increased costs of materials were significant factors in narrowing Graham Magnetics, Inc.'s 1975 profit margin, President G.A. Jaggers said.

Earnings for the year dipped to $1.2 million or $1.33 a share from the record high of $1.4 million or $1.46 a share in 1974.

Revenues rose to $15.8 million from $15.3 million in 1974.

Management was gratified the company "succeeded in maintaining sales volume in spite of the sharp downturn in the economy" in fiscal 1975, Jaggers said.

Profit from operations exceeded that of any year besides 1974, he added.

Tektronix Reaps 8% Earnings Rise

BEAVERTON, Ore. – Tektronix, Inc. has announced an 8% increase in first-quarter earnings compared with the same quarter a year ago.

Earnings for the first quarter ended Aug. 23 were $5.76 million compared with $5.31 million a year ago or 66 cents a share, up from 61 cents a share last year.

Sales increased 3% to $74.8 million from $72.8 million a year ago.

MDS, Holder of Note Settle Default Claim

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) said it has reached a tentative settlement with the holder of a $10 million note which had claimed MDS was in default.

Substitute Notes

Under the proposed agreement, MDS will substitute a new set of notes to Source Capital, Inc., one for $6.5 million due in 1982 and one for $3.5 million due in 1984.

Approval is required from MDS' banks because the agreement gives the $6.5 million note equal status with a $100 million revolving-credit agreement with the banks. MDS said it expects approval soon.

Contracts

Stansaab Elektronik AB has received a contract from the Polish State enterprises PHZ Metronex and ZUK Mera-Elzab to provide production equipment and technical know-how for manufacture of the Alfaskop data terminal system.

Access Corp. has been awarded a contract by the U.S. Army for the automation of all active-duty army personnel records. The system will utilize updateable microfiche technology to simplify record retrieval.

Carterfone Communications Corp. has received an installation and peripheral equipment maintenance contract from Transamerica Computer Co. covering about 600 key-to-tape data stations owned by Transamerica.

Financial Industry Systems has received a three-year resource management contract from Middlesex Mutual Assurance Co. to manage DP systems and operations.

Interdata, Inc. has received a $300,000 follow-on contract from Cybermed Corp. for Interdata 7/16 and 7/32 minicomputers to be used in hospital laboratory systems.

Datum Data Acquisition Division has been awarded a $1.1 million contract to provide a complete turnkey data acquisition system for the U.S. Air Force, to be used for rocket propulsion testing.

Leasco Software, Ltd. has been awarded a $4 million contract from British Steel Corp. to design and develop software for a telecommunications network which will link British Steel's plants, offices and computer bureaus throughout the UK.

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Earnings Reports

CENTRAL OATA SYSTEMS
Year Ended May 31

	1975	1974
Shr Ernd	$1.00	$.82
Ravenue	10,170,507	8,985,315
Earnings	461,482	377,197

COMPUTERVISION
Three Months Ended June 30

	1975	1974
Shr Ernd	.....	$.25
Revenua	$5,607,000	6,794,000
Earnings	(148,000)	580,000
8 Mo Shr	.....	.47
Ravenue	10,276,000	12,325,000
Earnings	(325,000)	1,080,000

SANOERS ASSOCIATES
Year Ended July 25

	1975 (000)	1974 (000)
Shr Ernd	$3.27	.....
Revenua	180,936	182,288
Spec Cred	a13,411	.....
Earnings	14,945	(19,067)
3 Mo Shr	.12	.....
Revenua	51,801	41,741
Spec Item	a189	b(1,146)
Earnings	546	d21,990

a-From tax-loss carryforward and $7.9 million gain from exchange of debentures. b-Reversal of tax-loss carryforward. d-Includes charge of $19.2 million from accounting change for lease acquisition and other costs and charge of $4.8 million to adjust certain inventories to net realizable value.

T-BAR
Three Months Ended June 30

	1975	a1974
Shr Ernd	$.18	b$.12
Ravanue	1,205,810	930,246
Earnings	74,878	49,596
8 Mo Shr	.35	b.21
Revenue	2,307,910	1,747,446
Earnings	147,947	87,568

a-Restated. b-Adjusted for 5% stock dividend paid in April 1975.

TRACOR
Three Months Ended June 30

	1975	a1974
Shr Ernd	$.59	$.48
Revenua	26,181,000	23,982,000
Disc Op	.....	(25,000)
Tax Cred	755,000	553,000
Earnings	1,460,000	1,114,000
6 Mo Shr	1.05	.83
Revanua	49,178,000	44,635,000
Disc Op	.....	(8,000)
Tax Cred	1,283,000	954,000
Earnings	2,583,000	2,018,000

a-Restated.

ELECTRONIC ASSOCIATES
Three Months Ended July 4

	1975	a1974
Shr Ernd	$.04	$.03
Revenue	8,499,000	9,013,000
Disc Op	.....	(311,000)
Tax Cred	15,000	.....
Earnings	98,000	74,000
6 Mo Shr	.20	.....
Ravenue	15,390,000	15,244,000
Disc Op	.....	(433,000)
Tax Cred	236,000	.....
Earnings	525,000	(186,000)

a-Restated to reflect discontinued operations.

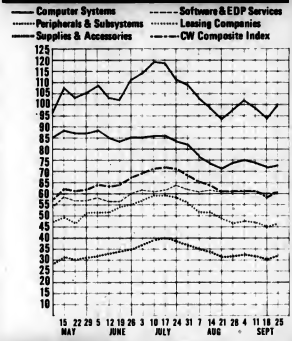
COMPUTER AUTOMATION
Year Ended June 29

	1975	1974
Shr Ernd	$.70	$1.13
Ravenue	21,372,000	19,653,000
Earnings	1,185,000	1,894,000
3 Mo Shr	.22	.33
Revenue	5,761,000	5,893,000
Earnings	392,000	555,000

COMPUTER INSTALLATIONS
Three Months Ended March 31

	1975	1974
Shr Ernd	$.03	$.03
Revenue	341,155	264,684
Earnings	27,254	21,898

COMPUTERWORLD Computer Stock Trading Indexes



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Computerworld Stock Trading Summary

CLOSING PRICES WEONESDAY, SEPTEMBEP 24, 1975

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

CONPUTER SYSTEMS

PRCH		1975 RANGE 111	CLOSE SEP 24 1975	WEEK NET CHNGE	MEER PCT CHNGE
N	BUPPCUGHS CORP	62-109	89 3/4	+5 3/8	+6.3
C	COMPUTEP AUTONATION	2- 10	9 3/4	+ 7/8	+9.8
N	CONTROL OATA CORP	11- 23	16 3/8	+1	+6.5
N	OATA GENEPAL COPP	10- 38	31	+4 3/4	+18.0
O	DATAPOINT CORP	6- 26	21 1/4	+2 3/4	+14.8
O	OIGITAL CCMP CCNTROL	1- 4	2 1/2	0	0.0
N	OIGITAL EOUIPMENT	46-122	119 3/4	+11 1/4	+10.3
N	ELPCTRONIC ASSOC.	2- 3	2 3/4	+ 3/8	+15.7
A	ELECTPONIC ENGINEER.	5- 10	8 5/5	+ 3/8	+4.5
N	POPPORD	23- 42	26 1/4	+1	+3.9
O	GENERAL AUTLMATION	6- 14	6 3/4	0	0.0
C	GPI CONPUTEP CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARO CO	58-120	96 5/8	+5 5/8	+6.1
N	HONEYWELL INC	22- 40	28 7/8	+1 1/4	+4.5
N	IPN	158-224	191	+11 1/4	+6.2
O	NEMOPEP	1- 10	7 1/8	+ 1/4	+3.6
C	MICRCDATA COPP	2- 6	5 5/8	+ 5/8	+12.5
O	MODULAR CONPUTER SYS	5- 19	13 1/2	+1 3/4	+14.8
N	NCP	15- 39	25 1/2	- 1/4	-0.9
O	PPINE COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERPIN-ELMER	16- 30	22 7/8	- 1/4	-1.0
N	PAYTHECN CO	26- 59	54 1/2	+5 3/4	+11.7
N	SINGEP CONPANY	10- 17	11 1/2	- 1/4	-2.1
N	SPEPPY RANO	26- 49	40 1/4	+4 1/2	+12.5
A	SYSTEMS ENG. LABS	1- 5	3 3/8	+ 1/4	+8.0
O	ULTIMACC SYSTENS INC	1- 6	5 5/8	0	0.0
N	VARIAN ASSOCIATES	7- 19	14 3/4	+1 7/8	+14.5
N	WANG LABS.	7- 17	11	+1 5/8	+17.3
N	XEROX CORP	51- 86	54	+1	+1.8

LEASING CONPANIES

PRCH		1975 RANGE 111	CLOSE SEP 24 1975	WEEK NET CHNGE	MEER PCT CHNGE
O	COMDISCO INC	1- 5	3 5/8	+ 1/4	+7.4
A	CONMERCE GROUP CORP	2- 4	2 5/8	0	0.0
A	CONPUTER INVSTPS GPP	1- 2	5/8	+ 1/8	+37.5
M	OATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	1- 1	1/2	0	0.0
N	OPP INC	3- 6	4 3/4	0	0.0
O	EDP PESOUPCES	1- 2	1	0	0.0
A	GPANITE NGT	1- 5	4 1/8	0	0.0
A	GREYHOUND CONPUTER	2- 3	3	+ 1/2	+20.0
A	ITEL	3- 9	6 1/2	+ 1/2	+8.3
N	LEASCO CORP	4- 5	6 3/8	+ 7/8	+15.9
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO NGT INC	1- 1	1/8	0	0.0
C	NRG INC	0- 4	3/4	- 7/8	-53.8
A	PIONEEP FER CORP	2- 7	5	0	0.0
A	ROCKWOOD COMPUTEP	1- 1	1/4	0	0.0
N	U.S. LEASING	7- 14	7 1/4	+ 1/4	+3.5

FXCN: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EOP SERVICES

EXCH		1975 PANGE (1)	CLOSE SEP 24 1975	WEER NET CHNGE	WEEP PCT CHNGE
O	AOVANCED CONP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 3/4	+ 1/8	+7.6
N	AUTONATIC DATA PROC	29- 65	50	+4 1/4	+9.2
O	BPANCON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTPAL CATA SYSTENS	3- 7	7 1/8	+ 1/2	+7.5
O	CONPUTEP DIMENSIONS	2- 6	3	- 3/4	-20.0
O	CONP ELECTION SYSTNS	3- 6	5	- 1/4	-4.7
C	CONPUTER HORIZONS	1- 1	1	+ 1/4	+33.3
C	CONPUTER NETWORK	1- 3	2 5/8	0	0.0
N	COMPUTER SCIENCES	2- 6	5 1/8	+ 1/8	+2.5
O	CONPUTEP TASK GROUP	1- 1	5/8	0	0.0
C	CONPUTEP USAGE	2- 4	2 1/8	0	0.0
O	CONSHAPE	3- 4	2 1/2	- 3/8	-13.0
O	OATATAB	1- 2	1 3/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC OATA SYS.	12- 28	16 3/8	+ 7/8	+5.6
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
C	KEANE ASSOCIATES	2- 3	2	0	0.0
O	KEYDATA CORP	2- 3	2 3/8	0	0.0
C	LOGICON	3- 5	3 3/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 7/8	0	0.0
O	NATIONAL CSS INC	6- 14	11 7/8	+1 1/4	+11.7
O	NATIONAL CONPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTENS INC	8- 17	11 1/8	+ 1/8	+1.1
N	PLANNING RESEARCH	2- 6	3 3/4	0	0.0
O	PROGPANMING & SYS	1- 1	5/8	0	0.0
O	PAPLDATA INC	2- 5	3 1/8	- 1/4	-7.4
C	PEYNOLDS & REYNOLD	10- 24	13 1/2	+2 1/2	+22.7
C	SCIENTIFIC CONPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	+ 1/8	+11.1
O	TYPSHAPE INC	7- 21	18	+1 1/4	+7.4
A	URS SYSTENS	2- 4	3 1/4	- 1/8	-3.7
N	WYLY CORP	2- 4	3	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1975 PANGE (1)	CLOSE SEP 24 1975	WEER NET CHNGE	WEEP PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 9	7 3/8	- 1/4	-3.2
O	AOVANCED MENORY SYS	1- 7	4 7/8	+ 1/2	+11.4
N	AMPEX CORP	3- 7	5 5/8	+ 3/4	+15.3
C	ANDERSON JACOBSON	1- 3	1 7/8	+ 1/8	+7.1
O	BEEHIVE MEDICAL ELEC	1- 5	3 3/8	+ 1/4	+8.0
A	BOLT,BEPANEK & NEW	5- 13	9 7/8	+ 1/4	+2.5
N	BUNKER-RAMO	4- 8	4 3/4	0	0.0
A	CALCOMP	4- 7	4	+ 1/4	+6.6
O	CAMBRIDGE MEMORIES	2- 5	2 3/8	- 3/8	-13.6
N	CENTRONICS DATA COMP	7- 25	18	+3 3/8	+23.0
C	CODEX CORP	15- 38	36 1/2	+5 3/4	+18.6
C	COGNITRONICS	1- 2	1	+ 1/4	+33.3
O	COMPUTER COMMUN.	1- 2	3/4	- 1/4	-25.0
C	CONPUTER CONSOLES	3- 7	4 1/4	+ 1/2	+13.3
A	CONPUTEP EQUIPMENT	1- 2	1 7/8	+ 1/8	+7.1
O	CONPUTEP MACHINERY	1- 2	1 1/4	0	0.0
C	CONPUTER TRANSCEIVER	1- 2	1 1/8	0	0.0
C	CONTEN	2- 5	2 7/8	- 1/8	-4.1
N	CONNAC CORP	12- 23	19 1/4	+3 1/2	+22.2
O	OATA ACCESS SYSTENS	1- 3	2	0	0.0
O	DATA 100	5- 16	9 1/4	+ 5/8	+7.2
A	OATA PRODUCTS CORP	2- 6	4	+ 3/4	+23.0
O	OATA TECHNOLOGY	1- 3	1 3/4	+ 1/8	+7.6
O	DATUM INC	1- 2	1 1/4	+ 1/8	+11.1
O	DECISION DATA CONPUT	4- 7	4 1/4	- 1/4	-5.5
O	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
C	DI/AN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/4	+ 1/8	+7.6
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENEPAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	3- 6	4	- 1/8	-3.0
N	HARRIS CORP	18- 28	22	+1 1/4	+6.0
A	INCOTERM CORP	3- 12	9 7/8	+ 3/4	+8.2
C	INFOREX INC	2- 5	2 5/8	+ 1/8	+5.0
O	INFORMATION INTL INC	8- 14	10 3/8	- 1/2	-4.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	3/8	0	0.0
A	MILGO ELECTRONICS	8- 24	17 1/9	+1 1/2	+9.5
N	MOHAWK DATA SCI	1- 5	3 5/8	+ 5/8	+20.8
C	OPTICAL SCANNING	1- 3	3	0	0.0
O	PENRIL CORP	2- 2	1 1/8	0	0.0
O	PERTEC CORP	2- 3	4 1/4	- 1/4	-5.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	5/8	- 1/8	-16.6
O	QUANTOR CORP	2- 6	5	0	0.0
O	RECOGNITION EQUIP	2- 9	6 1/4	+1	+19.0
N	SANDERS ASSOCIATES	3- 11	7 5/8	+1 3/8	+22.0
O	SCAN DATA	1- 3	1 3/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	12 5/8	+1 1/8	+9.7
O	SYCOR INC	5- 15	13 1/2	+1	+8.0
O	T BAR INC	3- 6	6	+ 3/8	+6.6
O	TALLY CORP.	1- 5	3 1/4	0	0.0
O	TEC INC	1- 4	3	0	0.0
N	TEKTRONIX INC	18- 41	37	+4	+12.1
N	TELEX	1- 3	2 1/8	+ 1/8	+6.2
O	WANGCO INC	4- 9	5 1/4	- 3/8	-6.6
O	WILTEK INC	1- 4	2 1/2	0	0.0

SUPPLIES & ACCESSORIES

ERCN		1975 PANGE (1)	CLOSE SEP 24 1975	WEEP NET CHNGE	WEER PCT CHNGE
C	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 7	6 1/8	+ 3/8	+6.5
O	CYBERNATICS INC	0- 1	3/8	- 1/8	-25.0
A	DATA DOCUMENTS	29- 42	32 1/2	0	0.0
O	DUPLEX PRODUCTS INC	12- 25	15 1/2	- 1/2	-3.1
A	ENNIS BUS. FORMS	5- 7	5	0	0.0
O	GRAHAM MAGNETICS	5- 10	8 1/2	+ 1/4	+3.0
C	GRAPHIC CONTROLS	8- 21	13 1/2	+1 3/4	+14.8
N	3M COMPANY	43- 68	54	+4 3/8	+8.8
O	MOORE CORP LTD	39- 51	45	+1 3/4	+4.0
N	NASHUA CORP	11- 22	12	+ 7/8	+7.8
O	STANDARD REGISTER	11- 20	16 1/4	+ 3/4	+4.8
O	TAB PRODUCTS CO	4- 8	6	0	0.0
N	UARCO	17- 24	19	- 1/4	-1.2
O	VANIER GRAPHICS CORP	4- 7	4 1/2	0	0.0
A	WABASH MAGNETICS	3- 5	3 3/4	- 1/4	-6.2
N	WALLACE BUS FORMS	15- 25	16 1/2	+ 3/8	+2.3

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